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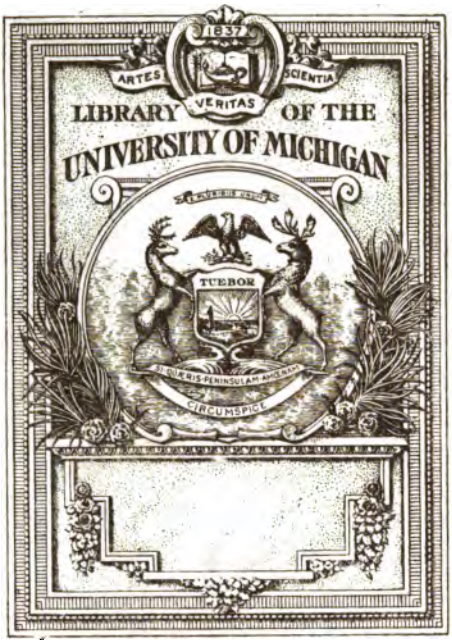

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EIGHTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH,

1899—1900.

Duplicate

RALEIGH:
EDWARDS & BROUGHTON AND E. M. UZZELL, STATE PRINTERS.
PRESSES E. M. UZZELL.
1900.

MEMBERS OF THE BOARD.

ELECTED BY THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA.

George Gillett Thomas, M. D., President	Wilmington.
S. Westray Battle, M. D.	Asheville.
Henry W. Lewis, M. D.	Jackson.
Henry H. Dodson, M. D.	Milton.

APPOINTED BY THE GOVERNOR.

*Charles J. O'Hagan, M. D.	Greenville.
J. L. Nicholson, M. D.	Richlands.
Albert Anderson, M. D.	Wilson.
A. W. Shaffer, Sanitary Engineer	Raleigh.
Richard H. Lewis, M. D., Secretary and Treasurer	Raleigh.

The term of all the members expires May, 1901.

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*Deceased.

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EIGHTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH,

1899–1900.

RALEIGH:
Edwards & Broughton and E. M. Uzzell, State Printers.
PRESSES E. M. UZZELL.
1900.

LIST OF COUNTY SUPERINTENDENTS OF HEALTH IN THE STATE OF NORTH CAROLINA, DECEMBER 31, 1900.

Alamance	Dr. T. S. Faucette.
Alexander	Dr. T. F. Stevenson.
Alleghany	Dr. B. C. Waddell.
Anson	Dr. E. S. Ashe.
Ashe	Dr. Manley Blevins.
Beaufort	Dr. P. A. Nicholson.
Bertie	Dr. H. V. Dunstan.
Bladen	Dr. Newton Robinson.
Brunswick	Dr. J. A. McNeill.
Buncombe	Dr. James Sawyer.
Burke	Dr. J. L. Laxton.
Cabarrus	Dr. D. G. Caldwell.
Caldwell	Dr. A. A. Kent.
Camden	
Carteret	Dr. F. M. Clark.
Caswell	Dr. S. A. Malloy.
Catawba	Dr. Geo. H. West.
Chatham	Dr. H. T. Chapin.
Cherokee	Dr. J. F. Abernathy.
Chowan	Dr. T. J. Hoskins.
Clay	Dr. J. M. Sullivan.
Cleveland	Dr. B. H. Palmer.
Columbus	Dr. I. Jackson.
Craven	Dr. R. DuVal Jones.
Cumberland	Dr. J. Vance McGougan.
Currituck	Dr. H. M. Shaw.
Dare	Dr. W. B. Fearing.
Davidson	Dr. Joel Hill.
Davie	Dr. James McGuire.
Duplin	Dr. James W. Blount.
Durham	Dr. Z. T. Brooks.
Edgecombe	Dr. L. L. Staton.
Forsyth	Dr. John Bynum.
Franklin	Dr. E. S. Foster.
Gaston	Dr. J. H. Jenkins.
Gates	Dr. W. O. P. Lee.
Graham	Dr. R. J. Orr.
Granville	Dr. S. D. Booth.

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Green	Dr. Joseph E. Grimsley.
Guilford	Dr. Edmund Harrison.
Halifax	Dr. I. E. Green.
Harnett	Dr. O. L. Denning.
Haywood	Dr. F. M. Davis.
Henderson	Dr. J. G. Waldrop.
Hertford	Dr. John W. Tayloe.
Hyde	Dr. E. H. Jones.
Iredell	Dr. Henry F. Long.
Jackson	Dr. Wm. Self.
Johnston	Dr. L. D. Wharton.
Jones	Dr. S. E. Koonce.
Lenoir	Dr. W. T. Parrott.
Lincoln	Dr. T. F. Costner.
McDowell	Dr. B. A. Cheek.
Macon	Dr. F L. Siler.
Madison	Dr. Jas. K. Hardwicke.
Martin	Dr. W. H. Harrell.
Mecklenburg	Dr. F. M. Winchester.
Mitchell	Dr. C. E. Smith.
Montgomery	Dr. M. P. Blair.
Moore	Dr. Gilbert McLeod.
Nash	Dr. J. P. Battle.
New Hanover	Dr. W. D. McMillan.
Northampton	Dr. H. W. Lewis.
Onslow	Dr. E. L. Cox.
Orange	Dr. C. D. Jones.
Pamlico	Dr. G. A. Caton.
Pasquotank	Dr. H. T. Aydlett.
Pender	Dr. L. L. Ardrey.
Perquimans	Dr. C. C. Winslow.
Person	Dr. J. A. Wise.
Pitt	Dr. C. O'H. Laughinghouse.
Polk	Dr. Earle Grady.
Randolph	Dr. T. T. Ferree.
Richmond	Dr. J. M. Ledbetter.
Robeson	Dr. H. T. Pope.
Rockingham	Dr. Sam Ellington.
Rowan	Dr. W. L. Crump.
Rutherford	Dr. W. A. Thompson.
Sampson	Dr. R. E. Lee.
Scotland	Dr. A. W. Hamer.
Stanly	Dr. V. A. Whitley.
Stokes	Dr. W. L. McCanless.
Surry	Dr. John. R. Woltz.

Swain	Dr. R. L. Davis.
Transylvania	Dr. M. M. King.
Tyrrell	
Union	Dr. J. E. Ashcraft.
Vance	Dr. Goode Cheatham.
Wake	Dr. J. J. L. McCullers.
Warren	Dr. A. L. Pendleton.
Washington	Dr. W. H. Ward.
Watauga	Dr. E. F. Bingham.
Wayne	Dr. Williams Spicer.
Wilkes	Dr. J. M. Turner.
Wilson	Dr. W. S. Anderson.
Yadkin	Dr. S. L. Russell.
Yancey	Dr. W. M. Austin.

LETTER OF TRANSMISSION.

North Carolina Board of Health,
Office of the Secretary,
Raleigh, January 7, 1901.

His Excellency, Daniel L. Russell,
Governor of North Carolina.

Sir:—In accordance with Section 3, Chapter 214, Laws of 1893, I have the honor to present for transmission to the General Assembly this, the Eighth Biennial Report of the North Carolina Board of Health.

Very respectfully yours,
Richard H. Lewis, M. D.,
Secretary and Treasurer.

EIGHTH BIENNIAL REPORT

OF THE

NORTH CAROLINA BOARD OF HEALTH,

1899-1900.

The biennial period just passed has been marked by greater progress on sanitary lines than any similar period since the establishment of the Board of Health. Our people have realized as never before the value and importance of preventive medicine. Two striking object-lessons, the widespread prevalence of small-pox throughout the State in sixty-six counties at one time or another since the first case on January 12, 1898, and the serious outbreak of typhoid fever in the fall of 1899 at the State Normal and Industrial College at Greensboro, among whose students nearly every county in the State had one or more representatives, brought home to the people in a most impressive manner the dangers that walk abroad with contagion and that lurk in impure drinking water. The interest in sanitation has become much more pronounced and much more extended in consequence of these visitations. In this light they have not been unmixed evils, as doubtless many more lives will be saved in the end by the better observance of sanitary laws in the future than were lost in the two epidemics.

Definite advance should be noted in the enactment by the General Assembly of 1899 of amendments to the medical license law, making the same probably the best in the whole country, and of an Act to Protect Water Supplies; and in the provision made by the State Agricultural Department for bacteriological examination of suspected drinking water, a most important work which was beyond the very limited resources of the Board of Health.

Inspections of all State institutions and of all public water supplies have been made.

The monthly BULLETIN has appeared regularly during the two years, and as it goes to every physician, Health Officer, Mayor and Chairman of Boards of County Commissioners in the State, it constitutes a most valuable medium of communication between the Secretary or executive officer of the State Board and all those who are most nearly concerned in the local administration of the health laws. It has been of especial value, convenience and economy during the small-pox epidemic.

Reports in detail on the various subjects coming under the jurisdiction of the Board will be found below.

MEETINGS OF THE BOARD.

MINUTES OF THE CALLED MEETING AT RALEIGH.

OFFICE OF THE SECRETARY,
RALEIGH, N. C., March 5, 1899.

Meeting called by the President to consider the small-pox situation in the State, as ascertained by the inspection just made in the eastern section by Drs. Thomas and O'Hagan, committee appointed by the President for the purpose. From their observations and from reports to the Secretary it was found that small-pox was present in Currituck, Pasquotank, Perquimans, Chowan, Tyrrell, Bertie, Edgecombe, Columbus, Alamance and Buncombe.

In view of the gravity of the situation, increased by the inefficiency of the management found in some places and the widespread opposition to vaccination found generally, it was decided, after full discussion, to ask the Governor to authorize the expenditure of a sufficient amount of the contingent fund conditionally appropriated in section 29 of the Act in Relation to the Board of Health for the employment of an inspector to visit all infected points, thoroughly inform himself as to the situation and advise the authorities as to the best management of the outbreak in every respect, impressing upon them and the community, as far as practicable, the value and importance of vaccination, said inspector to receive instructions from and report to the Secretary of the Board.

His Excellency was asked to grant the Board an interview at the Mansion, it being Sunday. The request was granted, and at the appointed hour the members present, Drs. Thomas and O'Hagan, Colonel Shaffer and the Secretary (Drs. Battle, Harrell and Nicholson could not be notified in time, and Dr. Whitehead was sick) met the Governor. They were pleasantly received, their statement of the case listened to attentively and the desired authorization of the necessary expenditure, as above set forth, promptly given.

Re-assembling in the office of the Secretary, Dr. Henry W. Lewis, Superintendent of Health of Northampton, was unanimously elected "Small-pox Inspector," at a salary of $150 a month and necessary expenses. The Secretary was instructed, in case Dr. Lewis should decline, to offer the place to Dr. Pendleton, Health Officer of Elizabeth City.

There being no further business, the Board adjourned.

RICHARD H. LEWIS,
Secretary.

MINUTES OF THE ANNUAL MEETING AT ASHEVILLE.

BATTERY PARK HOTEL, May 31, 1899.

First meeting of the Board of 1899–1901. The members elected by the State Medical Society are Drs. George G. Thomas, S. Westray Battle, Henry W. Lewis and Henry H. Dodson; those appointed by the Governor, Drs. Charles J. O'Hagan, J. L. Nicholson, Albert Anderson, Richard H. Lewis and Colonel A. W. Shaffer, Sanitary Engineer. Of these there were present, Drs. Thomas, H. W. Lewis, Dodson, Anderson, Colonel Shaffer and the Secretary.

The organization of the new Board being the first business in order, Dr. H. W. Lewis nominated for President and Secretary respectively the present incumbents, Drs. Thomas and R. H. Lewis, and they were elected.

The minutes of the last meeting were read and approved.

Dr. Henry F. Long offered his resignation as Small-pox

Inspector on the ground that his professional engagements for the immediate future would prevent his responding to every call. On motion, Dr. Long's resignation was not accepted, the understanding being that for the immediate future the demands upon him would be limited as far as practicable, and Dr. Joshua Tayloe was elected an inspector, the President being authorized at the same time to appoint another in his place, should he decline. On motion, the allowance of $10 a day and necessary expenses while on duty was made.

Discussing the work of the Board for the coming year, it was decided to have made an inspection of all State institutions, including convict camps, by committees of the Board to be appointed by the President.

On motion, the Secretary was instructed to obtain from the Attorney-General of this State an opinion as to the powers of the Board in the matter of compelling Boards of County Commissioners to elect County Superintendents of Health.

Various matters pertaining to the public health were discussed, particularly the best methods of providing for the prevention of small-pox, which was regarded as being an indefinitely continuing menace to the State, especially from Virginia, where the disease is prevailing and the management thereof very lax.

Dr. Anderson brought before the Board the question of payment for four (4) bacteriological examinations of suspected drinking water sent by Dr. Duguid, of Dover, Craven county, who claimed that Dr. Duffy, Superintendent of Health, had authorized the analyses. Dr. Duffy stated that he had authorized chemical but not biological analyses. Dr. Anderson made a proposition to the Board to pay him half the amount due, or twenty dollars ($20). On motion, the proposition was accepted, on the ground that the work was called for by such facts as would have justified having the analyses made, with the understanding, however, that no payments for such work will be made in future unless a signed permit accompanies the sample of water.

It was decided to hold the usual annual health conference with the people on a day in the fall to be selected by the President and Secretary. On motion, Wilson was selected as the place.

On motion, the Board adjourned to meet again at the Conference.

RICHARD H. LEWIS,
Secretary.

CONJOINT SESSION

WITH THE

STATE MEDICAL SOCIETY AT ASHEVILLE,

JUNE 1, 1899.

PRESIDENT'S ADDRESS.

The President, Dr. George Gillet Thomas, said in opening the session of the Board of Health and the State Medical Society:

It is hardly necessary to say that this joint meeting brings with it the report, chiefly, of small-pox. The Secretary has other matters of great and grave importance besides, but to the rank and file, the serious question that has been presented to us has been the care of small-pox in the counties and in the communities. Most of you know that for a number of years the many States of the Union have been largely infected by small-pox. Our neighboring States have had a large number of cases, but for a long time we enjoyed a wonderful immunity. Gradually, however, the disease has crept in, and its presence and the mode of its introduction is largely a matter of history. It has come chiefly from Georgia, Alabama, South Carolina and Virginia. I regret to say that the very imperfect care exercised by our neighbor on the north has endangered the health and lives of a great many citizens in the eastern counties of North Carolina. It has brought to this Board a great deal of trouble and anxiety, and to the local health and hospital authorities expense as well as anxiety.

I beg leave, as a part of what I have to say this morning, to submit to you the report of a committee appointed by the State Board of Health to start the investigation of small-pox in North Carolina. This was addressed to the Board, and by permission of the Secretary I read it to you:

WILMINGTON, N. C., May 16, 1899.

To Dr. R. H. Lewis, Secretary N. C. Board of Health, Raleigh, N. C.

DEAR SIR:—The State Board of Health has for the past two years seriously considered the outbreaks of small-pox in North Carolina, and during the winter and spring of 1898 sought to aid the local authorities as far as possible in the management of the disease wherever it appeared.

The first case reported was in Wilmington, January, 1898. Immediately following this case the Charlotte authorities found one in their midst. In both of these cities the disease was limited to the original cases, or a few persons immediately exposed to the infection. In Charlotte the authorities deemed it wise to have an expert sent in by the Marine Hospital Service to finally determine the character of the disease, which was somewhat in dispute, and also to advise as to the best management of the outbreak.

Shortly after this quite an epidemic of it appeared in Iredell county, and caused considerable alarm. Dr. C. P. Wertenbaker, M. H. S., at the request of local authorities, went to Statesville, and, as he had done in Charlotte, advised as to the best methods of isolating and controlling the disease. Under the wise management of Dr. H. F. Long, of Statesville, the malady at one time threatening the entire county of Iredell and the neighboring county of Rowan, was stamped out, not, however, until sixty odd cases had been treated. After this it appeared in Montgomery and Randolph, and in both of these counties Dr. Long took charge of affairs and managed them as successfully as he had done in his own county, first and last treating over two hundred cases. After this there appeared one case in Wilson and several in Durham.

During the hot months the disease disappeared.

In October it was introduced into Edgecombe county, from Norfolk, Va., and in the course of several months in the whole county and a part of Nash about seventy-five cases were treated. In January a case developed in Northampton, and later seven or eight more, all of the original ones coming from Norfolk or its vicinity. Of the subsequent outbreaks, which are not spoken of in the report, the Secretary will give you the full history.

The serious condition of affairs existing in Edgecombe county in January, 1899, induced the local authorities of that county to seek advice and aid of the State Board. The President of the Board met these authorities, and as the Board was in no manner provided with the means to assist materially the local authorities, and as the menace to all the Eastern counties was very marked, it was deemed wise that a committee be sent out to investigate the conditions that existed bordering on that portion of Virginia where small-pox was most prevalent, and to report to this Board such suggestions as appeared timely for its adoption in sending to aid the county officials in controlling the disease if it had appeared or in preventing its approach.

In pursuance of this determination of the State Board, a committee of Doctors Thomas and O'Hagan visited the counties of Pasquotank, Perquimans, Chowan, Washington, Wilson and Wayne. In Elizabeth City we found the physicians thoroughly alive to the situation. In a conversawith these gentlemen, we were informed that the cases of small-pox in the town had been isolated and vaccination was progressing quite rapidly under an ordinance making it compulsory. As far as possible all exposed persons and those not protected by vaccination in the county were sought out and protection afforded them. Your committee was afforded an opportunity to meet and address quite a large party of citizens who had assembled in the court-house. They urged upon the people the necessity to uphold the action of the authorities in the matter of vaccination which was then in progress. The outbreak in the county was much more serious, but the physicians in charge assured us that further spread would be limited. Reports which have reached this Board since the return of the committee amply justify the prediction of these physicians.

It was most encouraging to see here, and generally throughout our visit made under the orders of your Board, how closely to the right line the physicians were coming, and how thoroughly they appreciated and taught the value of vaccination. With very few exceptions, the physicians of the State have not sought to minimize the dangers of this dread disease or to allay the excitement, which was most salutary, except by promising to the citizens exemption from attack if they would submit to vaccination. As usual, these gentlemen of the profession have lowered the rates charged generally for vaccination, in order to assure to the general public the great boon that follows this preventive measure.

From Elizabeth City your committee went to the town of Hertford, and were received by the physicians most hospitably. At night we were greeted by a large portion of the citizens of the town and the neighboring country, including very many ladies. To this audience your committee appealed again for support of the local health authorities. We assured them that under the intelligent direction of the physicians of the good town and county ample protection would be afforded, if they would only see the necessity of earnestly asking for their advice, and being guided by it.

In Edenton, the next point visited, the situation seemed to be, under the wise direction of the best physicians, taking a very satisfactory course. The cases of small-pox were in the country, six or eight miles from the town of Edenton, no case of it having appeared then or since in the town. At short notice a meeting was called in the historic court-house of that honorable and ancient borough, and was attended by a large body of citizens, representing all classes

It is well to remark here, that at this meeting we were much aided by the unsolicited statement of one of the County Commissioners, a thrifty, honest farmer. He said that it behooved all persons to seek quickly and successfully the protection of vaccination, that he knew the horrors of small-pox, having suffered from its fearful ravages in his own family. He told most feelingly how he was left alone to do the nursing and care for the sick in his household, all of his neighbors and friends, frightened by the loathsome disease, standing afar off, and leaving him outside the pale of human aid and that helpful sympathy which is generally accorded by one's neighbors in times of distress. We hope the appeal was not without effect. From Edenton, we visited Plymouth. The bad weather which set in shortly after our arrival, prevented us from seeing as many of the citizens as we had hoped to meet and address; however, we sought here, as elsewhere, to impress upon the people the lesson we had started out to inculcate. At this point a summons reached us from the Secretary of the Board to go at once to Goldsboro, examine and report to the Mayor upon certain suspicious cases that existed in that town, none of which had been reported as small-pox except one. We visited four houses. In the first was the reported case. This was varioloid, and was the one about which there had been most question among the medical men of the town. One case was so suspicious that we suggested the house be placed in quarantine and watched. There were two other cases of small-pox of very marked character. We did not seek for any further information, as it was evident from these that the town was infected. We subsequently met the Board of Aldermen, at which time there were in attendance a large body of citizens. Here again we most earnestly urged prompt protective measures, both of isolation of the diseased persons and vaccination of all citizens who were not already protected.

From this point it was the intention of your committee to visit the counties of Northampton, Gates, Camden and Currituck. One of your committee subsequently visited the county of Halifax, and advised as to the management of affairs in the outbreak in that county. On the day succeeding the visit to Wayne county your committee thought it best to go to Raleigh and have a consultation with the Secretary and Colonel Shaffer, as members of the Board, before proceeding further in this matter, it being the opinion of your committee that the work which they had begun could only be efficiently done by an inspector who could devote his full time to it. At a meeting of the Board, held in the Secretary's office, it was unanimously resolved that the members present should visit his Excellency, Governor Russell, and lay before him the conditions as they appeared to the Board, explaining the situation in full, and asking him to provide for the employment of an inspector for a specified time. The report of the meeting of the Board and its visit to the Governor will appear in the Secretary's report of the meeting. It gives this committee pleasure to record the earnest interest of the Chief Executive of the State in the efforts of the State Board for the protection of the Commonwealth from a widespread invasion of the small-pox. A prompt response to our appeal for his aid was most encouraging, and bespoke a broad-minded realization of the dangers that existed in, and the methods necessary to avoid them, as well as an appreciation of the necessity for the maintenance of some such supervisory sanitary body as the State Board of Health. There was no hesitation in his response to our requests, and the work of Dr. H. F. Long, the inspector appointed, as the result of this visit to the Governor, shows itself. It seems to us safe to say that no community which he has visited has failed to understand the preparedness of this position of inspector, which his previous experience had given him.

We cannot close this report without recording that the exigencies of business forbade your committee from completing the tour originally mapped out for them, but it has a pleasing recollection of the visits as far as made, and to have met and known personally many of the able men who make up the profession in Eastern North Carolina, and feels amply repaid for the inconveniences and loss of time. It is a matter worthy of record, and one of which we may be justly proud, that these gentlemen so thoroughly understood the situation and so intelligently advised for its control. The *esprit de corps* of this part of the State's medical men is remarkable, and justifies among other things the many encomiums of praise that have been awarded them from time to time by disinterested and distinguished visitors to our yearly meetings. It is hoped that the work of your committee, so ably taken up and completed by Dr. Long, will be productive of much good, and that the advent of another winter will find the State very largely protected from further outbreaks of small-pox by a constantly increasing number of successful vaccinations.

By the experience of the past winter, and the intelligent work of Dr. Long, it is safe to hope that the Governor and his Council will come as generously to the relief of the State Board, should the cause arise demanding their aid and advice, in the coming months. But for the assistance derived from the Emergency Fund, as provided for by our Health Laws, the appointment of inspector would have been impossible, and while the members of the Board always responded to calls for their services, and for visits to infected points, the work was best done by one authorized person, who gave to it his full time, and happily for us the benefit of a large experience.

We have not, we fear, seen the last of small-pox, and another winter will most probably bring us new cases, but the Board feels justified in the assurance that if we are to deal with another series of outbreaks, methods for its control are now so well studied that the measures to be adopted under the guidance of the inspector will promptly stamp out the disease wherever it appears.

Yours truly,
GEO. GILLETT THOMAS,
CHAS. J. O'HAGAN,
Committee.

This seems right now the most important consideration for the Board of Health. I do not know that the physicians in North Carolina can undertake a more important measure than to preach the propaganda of vaccination, and the appearance of the disease at present seems to foretell a rapidly increasing death rate. The epidemic is evidently gaining in virulence. Such was the experience in South Carolina. The Secretary of the Board of Health of that State told me in March that after two years, without any apparent cause, the death rate ran rapidly from 1½ or 2 per cent. up to 10 per cent. and upwards, varying according to locality.. Next winter is going to bring us new cases, and a more virulent type of the disease. In Morganton in a recent outbreak the death rate has already reached 10 per cent., divided between negroes and whites about equally. It may be that the people will wake up to the fact that small-pox is a little worse than vaccination. Upon that point I wish to give expression to what appears to me a justified opinion. I believe that every physician who goes out among his clientele to preach vaccination, and who succeeds in convincing them of its necessity, ought also to impress upon them, absolutely, the care of the vaccinated arm. It is not bad virus, it is not anything ordinarily in the vaccinated person that is making these bad arms. It is the infection of the vaccinated point by a breach of the seal and the introduction of germs from without. I am so satisfied of this, that I would like to state to you a few facts which have convinced me. When small-pox broke out in Wilmington in 1898 I did a reasonably large number of vaccinations, covering all ages. I used at that time the virus from The National Vaccine Establishment in the District of Columbia and the Marietta Farm in Pennsylvania, indiscriminately, first one and then the other. In infants to whom tender care and special attention was given by both parents and nurses, I say this with guarded care, I know I did not have a single broken seal in the infants, all of whom went rapidly through the stages of typical vaccination, but among older children and adults such a favorable condition did not always obtain, as in many cases the vaccinated portion of the body was not protected, or a lack of care allowed a break in the seal, through which infection was induced, and the much-talked of sores said to result from bad virus, appeared. If you can by careful directions, which I do not deem it necessary to detail to this intelligent body, impress upon your patients both the reasons and methods of protecting the vaccinated points you will accomplish all that ought to result from this important measure and avoid the disagreeable ulcers that have so unfavorably prejudiced the laity against its adoption. As there can be no doubt of the necessity of vaccination, and as every doctor in the State is responsible to his patients for such timely advice as will protect them from the dire scourge of small-pox, it behooves you, one and all, to consider the best means of convincing those whose confidence in your skill has put the

health of themselves and their families under your care of the prime necessity of promptly erecting this sure and only barrier against the disease, the only sure protection known to the world against the disease—successful vaccination.

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH, 1898-'99.

RICHARD H. LEWIS, M. D., RALEIGH, N. C.

The Seventh Biennial Report of the Board to the General Assembly through the Governor, which gives a complete statement of its work for the two years ending December 31, 1898, includes that done between the time of our last meeting and that date. The report has been published, and as it will be sent to any one requesting it, it would be a work of supererogation to repeat it here. Suffice it to say that our principal work since we last met is included in: An official examination by Colonel A. W. Shaffer, the Engineer of the Board, of the water-sheds and works of the public water supplies of the State, including both chemical and bacteriological examinations of the same; an examination of the water supply of the State Hospital at Morganton, and of certain wells suspected of causing typhoid fever at Willardsville and at North Wilkesboro, infection with intestinal bacilli being found at both places; sanitary inspections of the State Hospital, a particular study being made of a small outbreak of typhoid fever there, the conclusion reached being that it was caused by an infection of a part of the milk supply; a sanitary inspection of the School for the Deaf and Dumb at Morganton, of the North Carolina College of Agriculture and the Mechanic Arts at Raleigh, and of the State Prison; an investigation, by request of the Superintendent of Health of Alamance county, of the conditions at Swepsonville, in the hope of ascertaining the cause of the very unusual outbreak there of malarial diseases; a health conference with the people of Winston-Salem.

SMALL-POX.

Since the period covered by the Biennial Report, the work of the Board outside the regular routine work of the Secretary has been practically confined to work in relation to legislation and to the management in an advisory way of the epidemic of small-pox which has been prevailing throughout the State. Although a part of this has been covered by the Biennial Report, it would doubtless be more satisfactory to consider the matter as a whole and report the epidemic from the first case to May 1, 1899.

SMALL-POX IN NORTH CAROLINA.

The first case occurred in Wilmington on January 12, 1898, in the person of a negro train hand on the Atlantic Coast Line, whose run was into South Carolina, in which State the disease was prevailing—warning of which was given in the BULLETIN for December, 1897. Prior to May, 1898, it showed itself in Charlotte, 5 cases, 2 deaths, all colored, origin South Carolina; in Salisbury, 1 case, colored mail agent running between that point and Knoxville, origin Tennessee; in Buncombe, 2 cases, colored, origin South Carolina; Alamance, 2 cases, colored, origin Alabama; Clay, 10 cases, white, origin Georgia. Since May 1st the disease has occurred in all the counties named except Clay, and in 32 other counties, making in all 38 counties that have been visited by it, the infection in most outbreaks coming from Norfolk, Va., and vicinity. The official reports for the month of April show small-pox still present in the following counties: Anson, 2; Bertie, 1; Chatham, 2; Chowan, 15; Currituck, 1; Gates, several; Hertford, 2; Iredell, 1; Martin, 3; Mecklenburg, 2; Moore, 4; Nash, 7; Union, 8; Wake, 43—14 counties. While new outbreaks have been reported since May 1, 1899: 5, Catawba (Hickory), Edgecombe (Rocky Mount), Gates, Rockingham (Mayodan), Burke (Morganton); the last named is the only one which does not appear in the tabulated statement given below. There have been so far 14 cases in Morganton, with two deaths among the whites. The reporter did not separate the races.

The total number of cases from the introduction of the disease into the State on January 12, 1898, to May 1, 1899, when the reports closed, was 616, with 17 deaths, or 2.76 per cent. Of this number 182 were whites, with eight deaths, 4.93 per cent., and 454 colored, with nine deaths, or 1.97 per cent. This death rate is somewhat larger than appears to have been the case in some other States whose records can be depended on—Ohio, for instance, where of 770 cases, only 7 died, or less than 1 per cent. Indeed our small-pox death rate has been quite respectable in view of the fact that many wiseacres have persisted in asserting that the disease was not small-pox but "chicken-pox," "Cuban itch," "elephant itch," etc. But still the mortality was very low, and that very fact increased the difficulty of managing the outbreaks, by rendering the people more indifferent to the importance of vaccination. Formerly when asked my opinion as to the best method of getting the people vaccinated, I would say: "A case of small-pox." Now I would say a number of cases, with several deaths.

In view of the rapid spread of the disease during the latter part of February it was thought advisable by the President of the Board to investigate the matter by a personal inspection of some of the infected districts on the part of a committee from the Board. This inspection of several of the Eastern counties was made by himself and Dr. O'Hagan, and the conditions were found to be such that he called a meeting of the Board at Raleigh on March 5th to consider them. At this meeting the report of the committee was received and the situation fully discussed, the unanimous conclusion being that the time had arrived for calling upon the Governor for authority to expend a part of the Emergency Fund appropriated in section 29 of the Act in Relation to the Board of Health. In pursuance of this decision the members of the Board present waited upon his Excellency and laid the facts before him. He showed his intelligent appreciation of the situation by promptly giving the authority desired. Re-assembling, it was decided to employ a competent physician who should, under the title of Small-pox Inspector, visit infected points, decide doubtful diagnoses, interview local health officers, explain to the county and municipal authorities the gravity of the situation and the best way of meeting it, and impress upon the people the overwhelming importance of vaccination. Dr. Henry F. Long, of Statesville, Superintendent of Health of Iredell, in view of his intelligent management of a considerable outbreak of small-pox in his own county, was selected for the place. The results have shown the wisdom of the action of the Board and of their selection, as the unanimous testimony from the points he has visited has been that his presence and advice have been of great assistance. I am satisfied that the State never spent the same amount of money to better advantage than the $395.75 spent in this cause from March 13th to May 1st.

Owing to the blessed fact that epidemics of infectious disease of any magnitude have been extremely rare in our State, our people are unaccustomed to the restraints and duties incident to the proper management of them according to the principles of modern hygiene, and this fact, combined with the mildness of the disease, engendering indifference to its dangers—such indifference in some instances at first, before the public were generally awakened to the fact that genuine small-pox was among us, that the patient not feeling much sick would not call in a physician—increased the difficulties of management. The exposures resulting from this were necessarily very numerous, and why so many unvaccinated persons escaped, as they unquestionably did, is a mystery. But strange as it may seem, the greatest trouble has come from our own profession. In some instances it arose from inexperience with the disease and the consequent failure to make promptly the correct diagnosis and report the case to the health officers. This was perhaps in some instances excusable, although it must be said that a knowledge of the elementary principles of sanitary rules or a regard for them would have insured the taking of the proper precautions. This, however, was a small matter compared to obstructions to the proper control of the disease which arose in another way, caused probably by unfortunate factional disagreements in the profession in certain communities—very few I am glad to say. I refer to the denial of the correctness of the diagnosis of small-pox by some physicians, thereby furnishing a centre for the intractable members of the community to rally around, and rendering the enforcement of the necessary regulations very much more difficult. Where the dissenting physician saw the case or cases in person it was doubtless an honest difference of opinion, but usually he refused to visit the patient, while he continued to publicly express his opinions. With the lights before me, I can see no sufficient justification for this attitude on the part of a medical man. In the matter of disease, the physician occupies with the people a position of authority, and as a patriotic citizen, to say nothing of his professional obligations, the abuse of that high position, from whatever motive, in a way calculated to increase the misfortunes of his neighbors, is, to express it in the mildest possible terms, extremely indiscrete. In every instance where the profession was united no trouble was experienced, the authorities, both county and municipal, responding promptly to their suggestions.

In addition to directing the movements of the inspector, I have written a great many letters to superintendents of health, mayors, county commissioners, and others, and have prepared two circulars—the first in July, 1898, which was sent with a letter to the editors of the newspapers of the State for publication, and the second in March, 1899, which was printed in the form of a poster, a copy of which is attached, which was sent to the superintendents of health with a letter requesting them to post in conspicuous places.

On the whole, when we take into consideration the conditions already alluded to, and, in addition, the imperfections in our sanitary machinery, I think there is good ground for congratulating ourselves and the State that the various outbreaks have been generally so well managed and that so many of the people have been vaccinated. While there has been a good deal of opposition to vaccination, it is gratifying to know that several enterprising communities with officials of nerve carried it out under compulsion, going so far in more than one instance as to commit the recalcitrant to jail, or to work upon the roads, until a more enlightened frame of mind was reached. This is fortunate, for the seeds having been widely distributed, there is reason to fear a recrudescence of the disease next winter and probably in a severe form.

The following is a tabulated statement of small-pox in the State from January 12, 1898, to May 1, 1899, when the last official report was received:

TABULATED STATEMENT.

RECORD OF SMALL-POX IN NORTH CAROLINA FROM JANUARY 12, 1898, TO MAY 1, 1899.

COUNTIES.	CASES.			DEATHS.		
	W.	C.	TOTAL.	W.	C.	TOTAL.
Alamance	20	2	22	1		1
Anson		5	5			
Beaufort		2	2			
Bertie		12	12		1	1
Buncombe		11	11		1	1
Catawba		13	13			
Chatham	1	18	19			
Chowan		21	21		1	1
Clay	10		10			
Columbus	2	2	4			
Craven		2	2			
Currituck	10	30	40			
Durham		8	8	1		1
Edgecombe	43	13	56			
Gates	4	30	34			
Guilford	3		3			
Halifax		9	9			
Hertford	1	2	3			
Iredell	16	57	73			
Johnston		1	1			
Lenoir	1	16	17	6		6
McDowell	14		14			
Martin		3	3			
Mecklenburg	1	7	8		3	3
Moore		6	6			
Nash		14	14			
New Hanover	3	3	6			
Northampton		9	9			
Pasquotank	14	35	49		1	1
Perquimans	1		1			
Rockingham		1	1			
Rowan	2	23	25			
Tyrrell	4		4			
Union		8	8			
Wake	5	64	69		1	1
Warren	3	1	4			
Wayne	3	24	27		1	1
Wilson	1	2	3			
Total No. cases in 38 counties	162	454	616	8	9	17
Death rate per cent.				4.93	1.97	2.76

LEGISLATION.

In the early part of the session of the recent Legislature I sent a circular letter to all superintendents of health asking for any suggestions they might have to make as to the amendment of our health law. Many did not reply at all and most of those who did had no amendment to suggest. Among those expressing an opinion, one or two favored an increase in the powers of the Board, for which public sentiment was not yet ready, but most confined themselves to the method of electing the county superintendent of health. They were about equally divided between retaining the present plan of election by the county commissioners and returning to the old plan of election by the county board of health. After very careful consideration of the matter, I finally settled upon a compromise method which, in short, constituted a new county board of health, to be composed of not more than three registered physicians, the county commissioners and the mayor of the county town, which board would elect the superintendent and fix his salary. This was regarded by those with whom I discussed it as a good solution of the difficulty, but knowing from experience how dangerous a discussion of any technical bill was, with no one on the floor thoroughly understanding it, I decided, after advising with some judicious friends, that the gain to be obtained was not sufficient to justify the risk, and abandoned it. I did, however, after a good deal of tribulation, succeed in securing the enactment of "An Act to Protect Water Supplies," which is an advance on the line of sanitary progress in the State. This matter is fully set forth in an editorial prepared for the May BULLETIN, which is now in press.

But the most important legislation bearing on the public health for many years was the amendment of the medical license laws so as to require of all applicants for license a diploma from a medical college in good standing, requiring an attendance of not less than three years and furnishing such facilities for clinical instructions as should meet the approval of the Board of Medical Examiners. It is unnecessary to say that nothing is so important to the preservation of the public health in a community as the thorough and practical education of its physicians. Acting formerly in another capacity, as chairman of the Committee on Legislation of the State Medical Society, I had the honor of assisting in securing the enactment of the amendments. As the medical license laws, as amended, were printed in full in the April number of the BULLETIN, it is unnecessary to discuss this matter further, other than to congratulate the Board and the Society on now having the best medical license law in the country.

The annual health conference was held in Winston-Salem on December 7, 1898. I thoroughly advertised it through the local newspapers, which were very kind in doing it, and by means of a circular-letter giving the programme, distributed in advance, but the attendance for a town of that size was a disappointment to us—caused in part, let us hope, by the uncomfortable climatic conditions prevailing at the time.

As per appointment, I attended the National Conference of State and Provincial Boards of Health of North America for 1898 at Detroit in August last, and that for 1899 at Richmond the 23d and 24th of this month. These meetings, composed entirely of practical health officers and members of boards of health, have been of value to your Secretary in reviving his interest, stimulating his zeal and in broadening his views. They afford an excellent opportunity in private conversations and in public discussions to compare the work and methods of the different boards, and in conclusion I wish to say, as the result of such a comparison, that, especially in view of the tremendous inertia on the part of the people—and largely of the profession, too, I regret to admit—and considering our meagre appropriation, we have no reason to be ashamed of our work—unsatisfactory as it is. But the people have been awakened, as never before in my experience, by the small-pox epidemic, and I hope that it is the beginning of better things.

MINIATURE OF POSTER SENT TO THE SUPERINTENDENTS OF HEALTH.

☞NOTICE!

PREVENTION OF SMALL-POX.

Small-pox is one of the most contagious and one of the most loathsome of all diseases.

It is now widely scattered over the United States and is prevailing at twenty points in our own State to-day. There is a danger of a widespread epidemic among our people.

Under these circumstances every eruption appearing after two or three days of headache, backache and fever, or even after merely a general bad feeling, especially if most prominent on the face and hands, should be regarded as small-pox, and the proper precautions taken promptly and continued until the patient is seen by a reliable physician.

Be not deceived by false prophets who seek popularity by prophesying smooth things and call it chicken-pox. According to one of the highest authorities, with a very few exceptions, chicken-pox is confined exclusively to childhood up to the age of twelve, and is rare after ten. So if the patient is past childhood it is almost surely small-pox, although it may be a mild attack. But mild cases can cause the severest form in the unvaccinated.

Fortunately, thanks to the genius and courage of the immortal country doctor, Edward Jenner, we have almost sure protection against the disease within reach of all in *vaccination*. If properly done it is practically as certain a preventive as a previous attack of small-pox itself. In Germany, with its fifty millions of people, in 1871, before vaccination was made compulsory, the number of deaths from small-pox was 143,000, while in 1897, under compulsory vaccination, it was only 116.

When small-pox is present in a community those who have been vaccinated before should be vaccinated again, as its virtues disappear more or less with time.

There seems to be a prejudice against vaccination on the part of some. This prejudice is due to ignorance of the facts. The effects of vaccination are really serious so seldom that they need not be taken into account. With the improved virus from the cow there is not the slightest danger of transmitting such human diseases as consumption, scrofula or syphilis.

Having this sure preventive right at hand, a panic on the subject of small-pox is utterly inexcusable. Those who are vaccinated—but only those—can laugh at small-pox and go on with their usual business in confidence.

Whenever small pox appears in a community it is all-important that the sick person should be separated from the well as soon as possible. No one should visit him, and only his physician and nurse should see him. In fact, when small-pox is prevailing visits of mere sympathy or curiosity should not be paid to any case of sickness until its nature has been declared by the attending physician.

All persons who have been exposed to small-pox should be vaccinated immediately and detained or quarantined in comfortable quarters for fifteen days from the time of exposure—until the danger of their having it has passed. Before leaving the house of detention they should take a thorough bath with warm water and soap and immediately after that another with some suitable disinfectant, and put on clean clothes from the skin out. The clothes in which they were exposed should be boiled or otherwise disinfected before being worn again, or removed from the house. The poison of small-pox can be carried in the clothes for an indefinite time.

Upon the occurrence of small-pox in a community the people should interest themselves in seeing that the regulations to prevent its spead are obeyed, for the sake of the business of the town as well as their own personal safety. This applies with special force to the operatives in factories and mills, for the reason that the shutting down of a mill is such a serious matter to them. Employment elsewhere cannot be expected, because no mill would receive hands from another mill among whose people the disease existed. Operatives at work are less liable to contract the disease than if idle and engaged in social visiting.

After the death or recovery of a person who has had small-pox everything that has been in contact with him should be burned or disinfected in the most thorough manner by the health officer.

Under the law (chapter 214, Laws of 1893) vaccination, quarantine, etc., are under the control of the County Superintendent of Health, or the medical health officer of a city or town, where there is one.

Ample powers are conferred by sections 23 and 25 upon the Boards of County Commissioners and the authorities of cities and towns to enforce the necessary rules, the language of one of the sections being that they are authorized to make such regulations, pay such fees and salaries and *impose such penalties* as in their judgment may be necessary for the protection of the public health.

The reason for such laws is that the State does not permit individual citizens, for a mere whim or prejudice, to endanger the health and lives and business of their more reasonable neighbors.

Let everybody be vaccinated promptly.

RICHARD H. LEWIS, M. D.,
Secretary State Board of Health.

REPORT OF THE STATE SMALL-POX INSPECTOR.

Dr. H. F. Long, State Small-pox Inspector, made the following report:

Before making my report I would like to say a few words about small-pox which is not included in the report. The great difficulty we have had in controlling the outbreak of small-pox in this State has been due to the mild form in which the disease existed. It came here, as best I can learn, from Mexico. It was brought by a railroad contractor who gathered a lot of negroes from Birmingham, Ala., and carried them to Mexico three years ago to work on a railroad. Every negro contracted small-pox as soon as he reached there, and as soon as he was well, without being disinfected and without change of clothing, he made his way back. There they came in contact with other negroes, and had what they termed "Mexican bump," and the disease existed among the negroes a long while before it spread to the white people. I have found that all over the State, wherever I have been, small-pox exists in the very mildest form, and I also find that you cannot find any of the old negro slaves who have not been vaccinated; the younger generation of negroes we have are not vaccinated, but they are direct descendants of people who have been vaccinated for generations. In McDowell county last winter I witnessed an outbreak. There were fifteen cases, and every case was confluent and every case was malignant, and the mortality rate was 50 per cent. So far as I can gather, no man in that community had ever been vaccinated. In Iredell we had seventy-five cases, and there were only twelve cases that anything like approached to the confluent form, and those who had it were very old negroes who had been vaccinated when they were children. We had no death at all in Iredell county, and almost all the cases were the very mildest form. At Morganton I inspected a family named Houston, and I think three died, and every case in the family has been confluent. One case was hemorrhagic, the best I can find. Houston's family had not been vaccinated, and Mrs. Houston told me that neither her father nor her husband had ever been vaccinated, and they had a mortality rate approaching the old mortality, before vaccination was discovered. A few hundred yards away I also inspected some cases among negroes who had been vaccinated, and it showed in the mildest form. So the further away from vaccination we are, the nearer approach we have to the confluent and malignant form. The nearer to vaccination we get, the nearer approach we have to varioloid. If small-pox strikes a neghborhood where people have been vaccinated for generations, the form will be mild. If it strikes a neighborhood where the people have not practiced vaccination, the form will be confluent and malignant, so the degree will depend altogether on locality—on how well the community is and has been permeated by vaccination. The report I have is short, and is simply the places I visited, and the number of cases I found:

STATESVILLE, N. C., May 28, 1899.

To Dr. R. H. Lewis, Secretary State Board of Health.

SIR:—I wish to submit to the State Board of Health the following report of the work done by me as Small-pox Inspector of the Board:

My first inspection was made at Greensboro, March 11, 1899, where I found a suspect, by name Fentress, who had been following the occupation of beer-bottler at Newport News, Va. He was taken ill February 27th, and was seen by Dr. Ledbetter on March 10th and by me on the 11th. Diagnosis, small-pox.

March 15th, at Warrenton; suspect, Mr. James Tarwater, white, aged 33 years; diagnosis by attending physician, Dr. T. J. Macon, small-pox. Well managed by physician in charge.

Burlington, N. C., March 16th. Inspection showed 19 cases of small-pox. No measures whatever had been taken to stamp out disease.

March 22, at Carthage, discovered one case, well quarantined, well managed; case came from Norfolk, Va. Attending physician, Dr. McLeod.

March 24th, inspected at Goldsboro. Found 15 cases of small-pox, 2 cases of chicken-pox, the latter in children. Attending physicians, Dr. Powell and Dr. Cobb.

At Kinston, March 25th, I found 8 cases of small-pox; 5 about recovered; all quarantined at their homes. The authorities took more active steps at once.

At Whiteville, March 26th; no cases then; history of one case which had recovered; at Brinkley, two cases had recovered. Attending physician, Dr. Harrell, had managed cases well.

Mt. Olive, March 29th; no inspection; history of case which had occurred 8 miles from town; had recovered and was gone. Had been treated by Dr. Aaron, who confessed he did not know what was the nature of disease.

At Fremont, March 29th; found two cases of small-pox in family named Barnes. These patients were sisters of a telegraph operator who had been treated for what was called chicken-pox. Attending physician, Dr. Lewis, who made diagnosis of chicken-pox.

At Wilson, March 29th; no inspection; history of two cases which had been well managed and dismissed by Dr. Moore.

Rocky Mount, March 30th; inspected 8 cases of small-pox in period of desiccation. Ordered disinfected and released. Dr. Wimberly in charge.

At Tarboro, 30th; no inspection; history of number of cases in county which had been well managed and discharged.

April 2d, Newton; found 2 cases in negro family. Attending physician, Dr. Moser. No action had been taken.

April 11th, at Pee Dee; found one case recovered; had come from Raleigh. Diagnosis by Dr. Kerr, syphilis.

April 12th, Northampton State farm, Halifax; one case, pustular syphilide, brought out by vaccination. Attending physician, Dr. Ferguson.

April 13th, at Washington; found 2 cases of small-pox in pest-house; were well managed by Dr. J. Taylor.

April 15; inspection at Monroe discovered 2 cases in pest-house. All well managed. Dr. Ashcraft.

Pittsboro, April 16th; found 4 cases in the conntry. Well managed by Dr. Chapin.

Charlotte, April 18th, found one case, a drummer named Sossamon. Well taken care of by Dr. Strong.

April 22d, at Greensboro; inspection of three cases in pest-house; found them suffering from pustular syphilide, induced by vaccination. Dr. Ledbetter in charge.

At Morganton, May 18th; inspected six cases; history of two deaths from small-pox; attending physician reported 15 cases in all. Dr. Laxton in charge.

At Hickory, May 23d; one case of small-pox; came from Morganton. Dr. Abernethy in charge.

Small-pox has occurred in this epidemic in all its forms, from mildest varioloid to most malignant confluent type, and one case of hemorrhagic small-pox, which died at Morganton. All cases of malignant small-pox that I saw occurred in those who had never been vaccinated and whose parents and forefathers had never been vaccinated. Every case of discrete, or even coherent small-pox, occurred in those whose parents had been vaccinated. In every instance the infection came from Virginia or South Carolina. In every town where I made inspection I reported to the mayor, board of aldermen and representative citizens, gave them my technique for handling and taking care of the disease, and urged compulsory vaccination.

Respectfully submitted,

HENRY F. LONG.

MINUTES OF THE MEETING AT THE HEALTH CONFERENCE.

WILSON, N. C., November 1, 1899.

Meeting of the Board at the Annual Health Conference with the people. Present, Drs. Thomas, Nicholson, Dodson, H. W. Lewis, Anderson, R. H. Lewis and Col. Shaffer. Dr. W. T. Pate, one of the bacteriologists of the Board, also present by invitation.

On motion, the Secretary was instructed to write to all county commissioners individually, urging upon those of the counties having no superintendents of health the immediate election of one, and upon all the great importance of making preparations for outbreaks of small-pox, at the same time recommending glycerinized vaccine points.

On motion, the Secretary was also instructed to write the judge holding the nearest court in the counties having no superintendents of health, quoting to him the opinion of the Attorney-General, calling attention to the anticipated dangers from small-pox during the coming winter, and asking him to charge the grand jury to indict the board of commissioners if they refuse to elect a superintendent after their attention has been called to it.

On motion, the Secretary was likewise instructed to publish in the BULLETIN the names of such water companies as fail to comply with the requirements of the act to protect water supplies, with comments; if they persist in refusal to comply, to send marked copies of said BULLETIN to a number of leading citizens of the town; and if they still fail of their duty in this matter, to have the water analyzed by one of the bacteriologists of the Board and publish the analysis.

On motion, the bacteriologists of the Board were requested to furnish for the use of the Board a standard blank form of the bacteriological examination of drinking water desired.

On motion, the State Veterinarian was invited to unite with the Board in its meetings.

On motion, the President appointed a committee to prepare and transmit to our fellow-member, Dr. S. Westray Battle, resolutions of sympathy in the great affliction that had befallen him in the recent loss of his wife.

On motion, there being no further business, the Board adjourned.

RICHARD H. LEWIS,
Secretary.

MINUTES OF THE ANNUAL MEETING AT TARBORO, MAY 22, 1900.

TARBORO, N. C., May 22, 1900.

Annual meeting of the Board. Present, Drs. Thomas, Battle, Dodson, H. W. Lewis, Nicholson, Anderson, Colonel Shaffer and the Secretary.

The minutes of the last meeting were read and approved.

On motion, it was ordered that the inspection of the public institutions of the State be completed.

On motion, the Engineer of the Board was directed to make the usual biennial inspection of the public water supplies of the State.

The Secretary called the attention of the Board to the fact that the State Board of Agriculture had equipped a biological laboratory, and proposed to employ a bacteriologist for the work of their department, and suggested that a formal request be made of them to make for us bacteriological analyses of suspected drinking waters as they have made chemical analyses for many years. The matter was discussed and the following preamble and resolutions were adopted:

WHEREAS, typhoid fever, with the exception of tuberculosis, is the most fatal to our people of all the preventable diseases, the number of deaths in the State from that cause alone annually being more than 1,000, and the number of cases that recover probably ten times as many; and

WHEREAS, this disease is nearly always conveyed by infected drinking water, which infection can only be ascertained by a bacteriological examination; and

WHEREAS, the appropriation made by the State for the work of the Board of Health is entirely inadequate to provide for more than a very few such examinations of the public water supplies during each biennial period; and

WHEREAS, we have been informed that the Board of Agriculture proposes to establish a laboratory with an expert in charge for the prosecution of its work in relation to pure food and the diseases of animals; therefore, *Resolved*, that the said Board of Agriculture be respectfully requested, for the good of the people of the State, slightly and inexpensively, to extend the scope of its laboratory so as to include investigations into the purity of suspected drinking waters, especially of wells and springs in the country districts, said investigations to be made upon the request of the Secretary of the Board of Health, under such regulations and restrictions as the Board of Agriculture may prescribe.

Resolved, that if the Board of Agriculture consider this request favorably the Secretary and the Engineer of the Board of Health confer with the officials or committee having the matter in charge, upon request, and arrange with them the details of the work.

Views as to the best practical management of the smallpox and vaccination problem were interchanged.

On motion, the Board adjourned to meet with the State Medical Society in conjoint session to-morrow.

RICHARD H. LEWIS,
Secretary.

CONJOINT SESSION

WITH THE

STATE MEDICAL SOCIETY AT TARBORO,

MAY 23, 1900.

Dr. Chas. J. O'Hagan presided in the unavoidable absence of President Thomas.

Dr. O'Hagan opened the conjoint session in the following address:

I have had honors thrust on me to-day in being called upon to preside over the conjoined meeting of the Board of Health and the State Medical Society. Honors of this kind sit very awkwardly on me, and if I do not wear them gracefully I hope I may wear them not disagreeably. The majority of you gentlemen can hardly recollect when the Board of Health of North Carolina was first formed. The Legislature of this State made a most munificent appropriation to this body of $200 per annum, which was not quite enough to furnish stationery and stamps. It was then in the hands of one of the best men belonging to the profession, Dr. Thomas F. Wood, and with this scanty amount with enthusiasm and zeal he continued to work and kept the thing alive until the beginning of another meeting of the Board, to whose unremitting labors is largely due the position in which it now stands.

By iterating and reiterating the importance of this work to the State, the State has been induced to make a larger, but still infinitely smaller than it ought to be, appropriation for carrying on this work, and the work it has done has been of immense value.

It had to begin at the beginning. It had to teach the laity throughout the country the immense value of pure water. For the first time attention was called to the fact that dirty water was one of the most fruitful sources of disease. They had to be called upon to explain the value of pure water and air, and yet the people had been breathing the one and drinking the other all their lives, and were ignorant that these primary elements were most fertile sources of diseases that sometimes decimated the whole country. Again this Board of Health has called the attention of the people to the arrest of epidemics and dangerous diseases. Like a sentinel on a watch-tower it has called the attention of the people of the

State to the recognized methods of prevention, and has induced them to take advantage of this, and in that way has done immense good, but still the province of the Board of Health is not limited to teaching people how they shall live, for there are other things as important. It has a wider scope, a longer range, and with your permission, gentlemen, I beg leave to call the attention of this body to certain views I entertain, hoping to convey through them to the laity some idea of their importance. While the world, in many respects, is very much better than it formerly was, in other respects it is no better. Seventy-five years ago the Lord Chancellor of England announced that the school-master was abroad in the land, and he has been traveling over the land and illiteracy is disappearing, but while illiteracy disappears, I fear that it is not followed by any corresponding improvement in the moral advancement of the world.

The clergy will tell you every Sunday from the pulpit that the world is getting worse, and while I do not agree with that broad statement, I fear, notwithstanding their labors for two thousand years, the world has not profited by them quite as much as it ought to have done. The great mistake that a medical man will point out for the vast amount of labor which has been wasted is the fact that he does not recognize the close relation which exists between the physical and psychological portions of man. The physical basis of life involves and contains every function, whether mental or physical, pertaining to the human being. We have been under the erroneous impression that the mental functions, the mental phenomena, were separate and distinct from the physical functions. The mental and physical are intimately related, and if you wish to improve one you must improve the other. This, then, is the reason why such a vast amount of labor has been wasted, thinking that we can cultivate the moral and intellectual without taking care of the physical. We have improved the physical, but I fear the moral has not been improved in corresponding relation. We have forgotten the effect of heredity. It has been well known for centuries among the people that like produces like—like father, like son. The belief has been firmly grounded in them for centuries and centuries, but no value was attached to it, no practical value was derived from it because no pains were taken to cultivate a race from which criminal and moral heredity should be eliminated. We all know we can improve the breed of cattle, whether food animals or work animals; by careful selection we have produced some of the noblest animals of the world. The Kentucky racer from the blue-grass of Kentucky was bred from the common banker pony. We look on truly indifferent to the fact that incompetent people hastily rush into the matrimonial relation and thereby propagate a crop of descendants equally incompetent and degenerated. We see also the criminal classes are allowed to meet and reproduce their kind. We find that constitutional diseases, such as insanity, epilepsy (which could hardly be called a constitutional disease), syphilis, and all those other things which descend from father to son, are allowed to go unchecked. And what is the result? To protect society from the incompetent and vicious and criminal classes the whole land is dotted with jails and prisons, enormous sums of money are expended annually to protect us from the criminal classes, and charitable institutions, like insane asylums, are more or less evidenced in this and other States to extend the hand of charity to these unfortunates. Year by year these expenses are increased, and year by year the criminals and incompetents, and others of a similar class, are increasing at a rapid ratio. Is there not a remedy for all this? Shall we allow the criminals and incompetents to increase *pari passu* with us, and year by year protect ourselves from the assaults of these classes? Is there no remedy? I think there is.

Among recent years the study of anthropology has been added as it were an annex to the medical profession, and we have taken the position of Alexander Pope that the proper study of mankind is man, but scientific study, and that will in no distant time provide a remedy, or at least a partial remedy. Assaults on personal property are not decreasing, and all the agents which have heretofore been called in to prevent them have each and all been signal failures. What shall we do to be saved? It seems to me that the school-master who is teaching to read and write, and the minister who is endeavoring to awaken in them a sense of their duty to themselves and to their Creator, have each failed because they have not come to the practical application of the knowledge they have. Legislation will not, I think, in the immediate future, and hardly, I fear, in the remote future, be called upon to provide a means. It does seem to me, gentlemen, that the marriage relation which is assumed so recklessly and thoughtlessly should be strictly subjected to State supervision, and no man or woman could get a marriage license who could not show a clean bill of health, that of the families on either side there was no constitutional disease, insanity, syphilis. They should bring a clean bill of health before the marriage license is issued to them.

Again, cripples, hunchbacks, and those unfortunates whose physical system is crippled and incapacitated for self-support, should be subjected to a rigid personal inspection, and unless they could furnish ample authority as it were, or information that they were capable of protecting themselves, and raising families without throwing an additional burden on the State, the right to propagate their species should be denied. It will be asked, how are you going to protect yourselves? That has not been answered yet, and I do not think will be at any time in a reasonable expectation of the future, but there is no doubt in my mind that if parents and guardians were called upon to subject a man or woman who proposed to enter their family to a rigid examination of family history, that a vast deal of misfortune could be avoided. The criminal classes must be dealt with in a similar manner. You, gentlemen, have heard something of the history of the Juke family, where one vagrant woman furnished a progency of two hundred and odd criminals, and cost the State of New York upwards of $7,000,000. Have such people the right to live? It seems to me that the safety of the public demands, if they are not exterminated, they should be at least kept under detention, and such portions of their organism as would perpetuate the breed should be removed. It was in 1867 that Andrew Johnston, the President of the United States, at a meeting in Knoxville, Tennessee, by men who had charge of the criminal institutions of the country, boldly proclaimed that all the criminals should be castrated, the women spayed, and held in some penitentiary, and in that way prevent the propagation of that class.

Again, young people under the influence of passion rush into the matrimonial connection, and the result is that thousands and tens of thousands of helpless creatures are thrown a burden upon society, and those who see these things in the large cities become hopeless in despair of the future. I took up a newspaper yesterday and in it saw a poem written by some good and generous and humane lady that struck me with some force, and I could not help sympathizing with her:

ON READING DANTE'S "INFERNO."

I too have been through hell, O Florentine;
Seest thou not by my visage it is so?
Bears it not still the impress of the woe,
The sin, the suffering, that mine eyes have seen?
Could any walk with countenance serene,
That once the anguish of such sight did know—
That through such paths in retrospect might go?
Canst thou not read it in my altered mein?

The voice of humankind throughout the years
Robs feast and dance and carnival of mirth,
And blurs for me the sunshine of the day,
I catch in laughter the sad sound of tears.
So that of me, as once of thee on earth,
"Lo, who hath been in hell," the people say.

This is an abject conception of the horrible sights of misery and woe and vice and crime that come under the inspection of people whose business it is to see those things. We, the medical men of the country, the plain country doctors, visit always and see all manner of sights of woe and sin and misery. Time and again do I think, will there ever be an end of this, when sin and sorrow will be banished from the earth? That it will come sooner or later, I firmly believe, but it will not come until the same care is exercised in the breeding of the race that there is in domestic animals, and when this is done and we can step from the heights of transcendentalism and apply the same laws of heredity that we apply to animals, I think if the millenium does not come, we will have a much better world than it is now.

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH, 1899-1900.

RICHARD H. LEWIS, M. D., RALEIGH, N. C.

The work of the Board, since my last report, in addition to the regular routine of the Secretary's office, made up chiefly of advice on sanitary subjects to individuals, municipalities, corporations and health officers in person, by letter, and by telegram, and the preparation of matter for the monthly BULLETIN, has consisted in inspections of some of the State institutions, the holding of the annual health conference with the people, and the effort to direct, as far as our powers permitted, the management of the epidemic of small-pox, which I regret to say has prevailed quite extensively throughout the State during the past year.

INSPECTION OF STATE INSTITUTIONS.

Inspections by committees from the Board, appointed by the President, have been made of the three Hospitals for the Insane, the University, the Normal and Industrial College, the two Agricultural and Mechanical Colleges, the School for the Deaf and Dumb at Morganton, and, at the special request of his Excellency, the Governor, of the abandoned convict camp at Castle Hayne, with a view to its healthfulness for that purpose. With the exception of the State Normal and Industrial College at Greensboro, we found all the institutions in a good sanitary condition, although a more abundant water supply is needed at the University.

Learning that the Board of Trustees of the Normal and Industrial College would meet before the report of the regular Committee of Inspection could reach them, I felt it my duty to make a personal visit to that institution and supplement the investigation already made, so that I might be in a position to advise directly with the Board. I was invited to appear before the Board and make to them a verbal report of my investigations, and to give them my views as to the situation. Having done this, I was requested to prepare a full and candid report, suppressing nothing, and give it to the leading newspapers of the State. This was promptly done, and sent to all the morning dailies in the State. It was also printed in the BULLETIN, and as every physician whose address is known receives regularly a copy of that publication, you have already read it, or have had an opportunity to do so, at any rate, and it would therefore be superfluous to repeat it here. After this report was given to the newspapers, I made two other visits to the Normal and Industrial College, and learned certain additional facts which confirmed the view first expressed, that the cause of the outbreak of typhoid was the water of the central well which was drunk by all the students taking their meals in the college, to whom the sickness was limited, and which was found by two bacteriologists, Drs. Albert Anderson, of Wilson, and A. C. Abbott, of Philadelphia, to be infected with intestinal bacilli. These new facts were set forth in a supplementary report, which was printed, together with the original report, in the BULLETIN for December, 1899. The medical report of the fever by Dr. W. P. Beall, of Greensboro, the chief consultant, was given to the profession through the columns of the *Carolina Medical Journal*, and was reprinted in the BULLETIN for February.

In round numbers, one-third of the total college population had fever, and there were fourteen deaths. As every county in the State had a representative in the student body, and most of them one among the sick, the deep solicitude and widespread interest felt throughout the State, not only in that particular outbreak, but in the subject of typhoid fever in general, its causation and its prevention, can be easily understood. Realizing this, I availed myself of the opportunity to "point a moral" at the conclusion of the report referred to in the following words:

"Every city and town should have an expert inspector of plumbing, and require inspection by him of every job before it is covered up and accepted, and all public institutions and other establishments with plumbing should require a similar inspection. Wells near sewers, or any accumulation of filth, especially of human origin, are dangerous. Guard with jealous care the purity of your drinking water."

Whether any of our cities and towns have acted upon the suggestion as to the employment of an expert inspector of plumbing, and the requirement that all plumbing work should be inspected and approved by him before being accepted, I have not been informed, but the suggestion as to drinking water did bear some fruit. The University and the Agricultural and Mechanical College for whites, of the State schools, and St. Mary's, at Raleigh, and the Horner Military School, at Oxford, of the private educational institutions, had bacteriological examinations made of their water supplies, thereby exhibited a progressive and enlightened spirit that is worthy of commendation, and setting an example that it would be wise for the others to follow.

While the outbreak of typhoid fever at the Normal and Industrial College is greatly to be deplored, its educational effect upon the people has been great, and the final result in the coming years will no doubt be the saving of many more lives than were lost. The history of sanitary science shows that no material advance in its practical application has ever been made, except as a consequence of some tragedy of this sort.

THE HEALTH CONFERENCE.

In the hope of interesting and instructing the people of some of our largest cities and towns in matters pertaining to the public health, meetings of the Board with the people for the purpose of discussing before and with them, in a practical and popular way, sanitary subjects, were inaugurated at Salisbury in 1893. Since that time similar meetings have been held in order at Washington, Charlotte, Goldsboro, Winston-Salem and Wilson. We have been assured that they were helpful in promoting the cause they were designed to serve, but it must be confessed that appreciation by the people of these efforts on the part of the Board has not increased, the first two having been the most successful. It is true that rival attractions of a more entertaining character have interfered on three occasions, and they may have been the explanation of the comparatively small attendance, although it has invariably been excellent in quality and respectable in numbers. It certainly cannot be attributed to a falling off in the quality of the work done by the members of the Board participating, as the papers and addresses were never better, if so good, as those presented at the last conference at Wilson, the announcement and programme of which was as follows:

HEALTH CONFERENCE AT WILSON, NOVEMBER 1, 1899.

AIMS AND OBJECTS.

The Conference is intended to be between the members of the State Board of Health and the people. Its object is to interest the people in sanitary matters by explaining and impressing upon them the great importance to the individual and to the community of a strict observance of the laws of health. Its proceedings will, therefore, be not technical but popular in character, and every one present will be invited to participate therein, by taking part in the discussions and by asking questions, which the members of the Board will take pleasure in answering to the best of their ability.

As the enforcement of sanitary rules in the family is largely in the hands of the mistress of the household, the ladies are especially invited to attend.

Papers or addresses are promised on the following subjects:

Old Age and How to Attain it—By Dr. J. L. Nicholson, Richlands, member of the Board.

Vaccination as an Economic Measure—By Dr. Henry H. Dodson, Milton, member of the Board.

Malaria and Mosquitoes—By Dr. Richard H. Lewis, Raleigh, Secretary of the Board.

A Discussion of the Health Laws now Operative and Reasons why they Should be Earnestly Supported by the Public—By Dr. George G. Thomas, Wilmington, President of the Board.

The North Carolina Health Law and the Local Health Officer—By Dr. Henry W. Lewis, Jackson, member of the Board.

Practical Hints on Drinking Water—By Dr. W. T. Pate, Gibson, one of the bacteriologists to the Board.

There will be a Question Box, and persons in the audience too modest to speak out in meeting can write them out and deposit them in the same for answer by some member of the Board. Opportunity will be given for this at the end of the discussion of each set subject.

The meetings will be held in the court-house at 10 A. M. and 7:30 P. M.

You are cordially invited to attend and bring your friends.

RICHARD H. LEWIS,
Secretary.

N. B.—The subjects will not necessarily come up in the order in which they appear above.

In view, however, of the sacrifice in time and labor required of the members of the Board, and the expense incident to the meetings, it is a question as to whether they should not be discontinued. An expression of opinion by members of the profession outside of the Board would be welcomed.

COUNTY SUPERINTENDENTS OF HEALTH.

In planning the construction of our health laws, the County Superintendent of Health was made what might be called the corner-stone. While the State Board is, in a general way, in charge of all matters relating to the public health, it has only advisory powers, and the actual practical work must be done by the superintendent. In a word, a county without a superintendent has no sanitary organization, and the health laws cannot be applied to its people. In spite of every effort, until recently, a considerable number of counties have utterly ignored the law commanding them to elect a superintendent. For years the number of counties having superintendents was less than seventy, then by special effort it was raised to eighty odd. At the time of our last meeting there were eleven counties having no health officer. The Board, at a meeting held at the time of the Conference at Wilson, realizing their utter helplessness in case of the introduction of small-pox, which they anticipated would become widespread, instructed its Secretary to write to every county commissioner in the derelict counties individually, calling attention to these facts, and urging the importance of the immediate election of a superintendent. The Secretary was also instructed to write to the judge holding the nearest court in said counties, asking him to charge the grand jury on our health law, and to suggest the indictment of the commissioners refusing to perform their duty. At the same time a letter to every commissioner in the State, setting forth the importance of making preparations for the probable appearance of small-pox, was ordered. I wrote to one judge, but whether he acted upon our request or not, I have never learned. The letters were sent to the commissioners, and eight new superintendents were elected, so that now only three counties—all very small—Camden, Pamlico and

Tyrrell have no health officer. The value of this official is coming to be more and more appreciated every day, thanks chiefly to small-pox, and it is to be hoped that in time he will be adequately remunerated for his services. Some counties, I am glad to say, have shown a disposition to do this by paying the superintendent $10 a day when engaged in small-pox work, although it must be admitted that many pay less and that many add nothing to the mere pittance.

THE OUTSIDE INSANE.

While the insane constitute a class of their own under the special care of other guardians, they cannot be properly ignored in a general consideration of the public health. Although our State has made generous provisions for these unfortunates in three well-equipped and admirably managed hospitals, the present accommodations are not adequate for the care of all who need it. Basing an opinion upon the recent excellent report of the State Board of Public Charities on this subject, which gives the number of insane, epileptics and idiots located at 766, it is not unreasonable to assume that there are at least one thousand of these stricken ones in jails, county homes and private families. It would be a work of supererogation to detail to a body of medical men, who are only too familiar with such sad sights, the horrors of the situation of many of them. No matter how good the intentions of their keepers may be, they cannot obtain the care and attention to which, as a matter of simple humanity, they are entitled, owing to the lack of facilities and of knowledge and experience in this particular kind of work on the part of those in charge. By a comparatively inexpensive amplification of our three State hospitals, all of the insane and most of the epileptics could be given expert care and treatment at a cost, in the aggregate, very much less than that incurred under the present system. It is to be hoped that the next Legislature will take action in this matter, and as our law-makers are largely influenced by public opinion, it seems to me that the adoption of a resolution setting forth the views of this body, which represents the medical profession of the State, would be in order.

PURE FOOD AND DRUG CONGRESS.

By appointment of the President, I attended, as a delegate from this Board, the third annual session of the National Pure Food and Drug Congress, which was held at Washington, March 7—9. The meeting was largely attended by representatives of all the interests involved from all parts of the United States. After a very full discussion of the relative merits of two bills setting forth the objects sought, which had been introduced in the House of Representatives by the Honorable Messrs. Brosius and Babcock, respectively, it was decided that the Brosius bill was the more satisfactory, and it was adopted as embodying the views and wishes of the Food Congress. The outlook for desirable legislation on this line is said to be favorable, if action can be obtained at this session. I would, therefore, respectfully suggest that a resolution calling attention to the importance of the subject, and asking the support of the Brosius bill by our Senators and Representatives in Congress be adopted by the conjoint session and forwarded to them at once.

SMALL-POX.

The history of small-pox in the State for the past twelve months has been an almost exact repetition of that of the preceding year, in every respect, excepting the number of cases, which has been nearly five times as great.

An exact comparative statement is as follows:

From January 12, 1898, to May 1, 1899—Number of cases (in 38 counties), white, 162; colored, 454; total, 616.

Number of deaths, white, 8; colored, 9; total, 17.

Death rate, per cent., white, 4.93; colored, 1.97; total, 2.76.

From May 1, 1899, to May 1, 1900—Number of cases (in 55 counties), white, 731; colored, 2,075; total, 2,806.

Number of deaths, white, 35; colored, 30; total, 65.

Death rate, per cent., white, 7.78; colored, 1.44; total, 2.31.

From this statement it appears that the proportion between the two races is almost exactly the same, the number of colored attacked being nearly three times as large as the number of white in both periods. The death rate has remained also nearly the same—a trifle less—the decrease being slightly more marked in the colored race.

The character of the disease has, as a rule, been very mild, and from that fact have arisen nearly all the difficulties in the management; the indifference, and often positive opposition, on the part of the people to vaccination; the reluctance of the authorities to institute and support effective measures of prevention, and the mistakes in diagnosis, including the disastrous effect upon public opinion of the efforts of some of the physicians making the mistakes to support their position. From the last of these three things has come the chief trouble. The matter has been so fully discussed in various issues of the BULLETIN during the year that I will not weary your patience by a repetition of it, but will merely cite two instances, the counties of Guilford and Rockingham. In both of these counties the disease was diagnosed chicken-pox by the attending physician, and in the latter the position was persisted in, notwithstanding the opinion to the contrary of an expert. In consequence, the proper precautions were not promptly taken, and the result was, in Guilford 509 cases with nine deaths, and in Rockingham 520 cases with 20 deaths, to which should be added the direct cost to the counties of thousands of dollars in handling the widespread epidemics, and the loss of tens of thousands in trade. In justice to the superintendents of both these counties, it should be said that the harm in the way of numberless exposures of unvaccinated persons was done before the disease was reported to them as small-pox, when only their responsibilities began. I have no reason to believe otherwise than that they are both good men, and efficient health officers.

The work of our inspectors, Drs. Joshua Tayloe, of Washington, and L. Harrill, of Statesville, whose reports are attached, has been of great value in settling disputed diagnoses, instructing superintendents new at the business, impressing upon the authorities the gravity of the situation, and explaining the best way to meet it.

In response to special requests from Greensboro, Winston, High Point, for a United States expert, I asked Surgeon-General Wyman, of the Marine Hospital Service, to send one of his men to these points. He promptly granted my request, and sent Passed Assistant Surgeon Wertenbaker, whose efforts were of material aid in setting public opinion right, and in inaugurating the proper precautions.

Upon the occurrence of a case of suspected small-pox in one of the students, I personally visited the University, at the request of President Alderman and Dr. Whitehead. I confirmed the diagnosis of small-pox already made by Dr. Whitehead, indorsed the precautionary measures already planned and in part inaugurated, and addressed the student-body, particularly upon the value and importance of vaccination. The entire absence of panic among the five hundred students, and the failure to spread from the first case under such circumstances, is sufficient testimony to the admirable management of those in charge there. I also personally visited Reidsville, at the urgent and repeated request of Superintendent Ellington, to aid him in securing the co-operation of the county commissioners with those of the town. I addressed both bodies in joint session, and was much gratified to learn that the county commissioners took action in the manner desired immediately upon adjournment, and to be assured since that my visit was really helpful.

Owing to the extreme mildness of the disease in many instances, no physician has been called in, and absolutely no precautions in the way of disinfection have been taken. This means, of course, a great many *foci* of infection for time to come. According to the reports of the superintendents, hardly more than ten per cent. of the people have been vaccinated on an average, though it should be said to the honor of this county of Edgecombe, whose hospitality we are now enjoying, that she heads the list in this good work with eighty per cent. of her entire population, rural as well as urban, vaccinated. The conclusion from these two facts is inevitable. There must be a recrudescence of small-pox next winter, unless the people are generally vaccinated between now and then on a much more extensive scale. Since the decision of the Supreme Court, in State Appellant *vs.* W. E. Hay, from Alamance, affirming the right of county and municipal authorities to enforce compulsory vaccination—a copy of which opinion, delivered by Justice Clark, was printed in the March BULLETIN—there need be no trouble about it. The responsibility rests upon the said authorities. And in this connection, let me say one word as to the duty of the medical profession in the premises. It is clear. They should, without ceasing, teach, preach and practice vaccination, and cordially support all authorities trying to bring it about.

In conclusion, I would say that the Board of Health, owing to the small-pox epidemic and the outbreak of fever at the Normal and Industrial College, has never been so much in evidence, and, apparently, so much appreciated by the people as during the past year.

RECORD OF SMALL-POX IN NORTH CAROLINA, FROM MAY 1, 1899, TO MAY 1, 1900.

COUNTIES.	CASES.			DEATHS.		
	W.	C.	TOTAL.	W.	C.	TOTAL.
Alamance	11	51	62			
Alexander	12		12			
Anson	12	18	30			
Bertie	3	16	19	2	1	3
Buncombe	27	6	33			
Burke	27	34	61	3		3
Cabarrus	10	3	13			
Caldwell		13	13			
Carteret	1		1			
Caswell	8	31	39	2		2
Catawba		1	1			
Chatham	5	90	95		3	3
Cherokee	1		1			
Chowan	3	30	33			
Cleveland	1	12	13			
Craven		1	1			
Cumberland		1	1			
Currituck	22	2	24			
Davidson	11	34	45		1	1
Davie	8	21	29		1	1
Durham	2	19	21			
Edgecombe		1	1			
Forsyth	8	4	12		1	1
Gaston		8	8			
Gates	18	100	118	1		1
Granville	1		1			
Guilford	64	445	509	2	7	9
Halifax	12	150	162			
Harnett	6	2	8			
Haywood	24	8	32			
Henderson		1	1			
Hertford	7	36	43		2	2
Iredell	1		1			
Johnston	15	24	39		1	1
Mecklenburg	2	48	50		1	1
Moore	16	76	92	1	1	2
Nash	22	24	46	2	1	3
New Hanover	1	15	16			
Northampton		14	14		1	1
Orange	20	24	44			
Pender		8	8			
Person	26	14	40	1		1
Randolph	11	7	18			
Richmond		29	29		1	1
Robeson	15	15	30			
Rockingham	144	376	520	16	4	20
Rowan	40	130	170	3	4	7
Rutherford	1	60	61			
Stanly	1	23	24			
Surry	105	12	117	2		2
Union		8	8			
Vance	2	1	3			
Wake	5	26	31			
Warren		2	2			
Washington		1	1			
Total No. cases (in 55 counties)	731	2,075	2,806	35	30	65
Death rate, per cent.				4.78	1.44	2.31

REPORT OF SMALL-POX INSPECTORS.

REPORT OF DR. TAYLOE.

DR. R. H. LEWIS,
Secretary State Board of Health, Raleigh, N. C.

SIR:—I submit herewith to the State Board of Health the following report of my work as Small-pox Inspector, from May, 1899, to May, 1900. In this report I give the towns, counties, number of cases examined, how managed and by whom. Also what precautions had been taken up to my inspection.

May, 1899—I made a trip to Gates county, this being my first inspection, examined a good many patients suffering from the mild forms of small-pox, two-thirds being white people. There existed in Gates county, at the time of my visit, thirty-five infected houses. No precautions had been taken. No superintendent of health.

May, 1899—I inspected the conditions in Currituck county. Six cases, two white and four colored, in charge of Dr. H. M. Shaw, Superintendent of Health. Some precautions had been taken.

June 23, 1899—Hertford county, at Ahoskie, I examined three cases, negroes, in charge of Dr. Tayloe, Superintendent of Health. They were well cared for.

Scotland Neck, Halifax county—Five cases were examined by me, all negroes. More negroes afterwards developed the disease, also some whites. No precautions had been taken until the time of my inspection, as a positive diagnosis was not made until then. Dr. Green, Superintendent of Health, then took charge, and with the assistance of Dr. Wimberley, managed the cases well.

June 3, 1899, Beaufort, Carteret county—Examined one case, white. Well managed by Dr. Frank Clark, Superintendent.

March 29, 1900, Robeson county—Inspected eight cases, five white and three colored. Some precautions had been taken. Drs. McNatt and Utley in charge.

Henderson, Vance county—I inspected one case, white. All necessary precautions had been taken by Drs. Cheatham and Bass, health officers.

April 1, 1900—Selma, Johnston county—Thirteen cases were inspected by me, seven white and six colored. Of these, two suffered with confluent type, one died. Moderate precautions had been taken by Drs. Wharton and Noble, health officers of county and town respectively.

April, 1900—Franklin county—Inspected four cases, all colored. Proper precautions were at once taken by Dr. Foster, Superintendent.

Small-pox has existed during this epidemic in all its forms, from the mildest to the most malignant confluent type, as expressed by Dr. Long.

In every town and county in which I made inspections I made reports to the town and county commissioners and local health boards, advising them as to the best possible means of stamping out and controlling the disease, without further spread. Also described the full technique of caring for patients and handling suspects, suggesting as thorough vaccination as possible in every section which I visited.

I advocate vaccination because I believe it to be the most powerful means of preventing the disease. I regard vaccine virus as the most active material that can be admitted into the list of our prophylactic remedies, and the only weapon of defense in overcoming the worst of human maladies.

The large majority of small-pox in the State has existed in a very mild type, in fact, the virtue of vaccination has so modified the disease that it is only in exceptional cases we have the opportunity of studying the malignant forms. I have had the opportunity in the present epidemic to examine only a few cases of the malignant forms of small-pox, and I am firmly of the opinion that such types of the disease can only exist in those who are absolutely without history of vaccination, and I mean by that, those whose parents and grandparents have not been vaccinated.

The protective influence of vaccination is so great that, from my experience, I am willing to assert that the vaccinated can only contract the disease by close and continuous contact or exposure. And if contracted then, it is of a mild and modified form.

Respectfully submitted,

JOSHUA TAYLOE, M. D.,
Small-pox Inspector.

REPORT OF DR. HARRILL.

STATESVILLE, N. C., May 19, 1900.

DR. R. H. LEWIS,
Secretary State Board of Health.

MY DEAR DOCTOR:—At your request I hereby submit a statement of visits made by me as Inspector. My appointment was made about the middle of January last.

January 20—I visited New London, Stanly county, where I found seven cases of small-pox, colored.

February 4—At Thomasville I saw two cases, colored.

February 10—At Asheville I saw twelve cases, whites.

February 20 to 22—Near Walnut Cove, Stokes county, saw two cases besides six or eight others recovered, and in the same county, at Pinnacle, saw three cases. A local doctor refused to accept my diagnosis. The leading case, and the one upon which I based my opinion, was in a woman, forty to forty-five years of age, with an eruption about nine days old when I saw her. The cases at Walnut Cove and Pinnacle were all white people.

February 23—I saw one case at Pilot Mountain. I visited Reidsville and saw the celebrated cases in a seminary there. I have been informed that persistent efforts were made by a local physician to discredit my opinion. Repeated vaccinations were made, but without results. I am informed that one of the patients afterwards carried the contagion to her home in some of her clothing, and from this source there were two malignant cases, resulting in death. I saw in Reidsville twelve or fourteen cases, but the actual number at that time was probably three or four times as many.

February 24—Visited Hillsboro. Saw two cases.

March 2—Visited Taylorsville and found six cases, all whites. Dr. H. F. Long also saw one of these cases, and confirmed my diagnosis.

March 24—I visited Jonesboro and found six cases in one family, all white. The mother and the grandmother in the same house had both been vaccinated when young, and both escaped the disease. I saw one other white man and two negroes with the disease.

April 16—Visited Shelby and found six cases in the same family of negroes. Another family of negro children had chicken-pox. At Mooresboro, one case, a negro man. At Fallston, in same county, I saw one case in a white man. Near Cleveland Springs, same county, I saw one case, a negro woman.

April 27—Visited Henrietta, Rutherford county, where I saw three cases, all negroes. One case reported at Caroleen, and one west of Rutherfordton that I did not see.

April 30—Visited Spray and saw three cases, all whites, besides several recovered and convalescent cases that I believe were the same disease.

May 1—Visited Madison and found that small-pox had been there four to six weeks. I saw one partly confluent case here. There had been in all about fifteen cases.

May 2—Visited Stem, Granville county, and found one case only developed, but a number of exposures.

This closes my list of visitations. There is a strong prejudice against vaccination, and decided opposition to any restriction or isolation of patients. Also, a determination to not believe there is any small-pox in the State. Unfortunately this belief extends to some of the doctors, and when one or more of that kind are in a community it is almost impossible to control the disease. I persuaded one doctor, a non-believer in vaccination, to go with me within thirty or forty feet of a well developed case. After seeing it, he decided that as he was practicing in the neighborhood, and had never been vaccinated, he ought to be.

In communities where the disease has been for several months, it is to be feared that there is already, and will continue to be, a relaxation of proper efforts to stamp out the disease.

Public meetings have been called in many places, and I have tried to advise the people about vaccinations. Hoping this imperfect report will be satisfactory, I remain,

Yours very truly,

L. HARRILL, M. D.,
Small-pox Inspector.

RESOLUTIONS ADOPTED.

The following resolutions were adopted by the Conjoint Session of the State Board of Health and the State Medical Society:

IN REGARD TO PURE FOOD, BY COLONEL A. W. SHAFFER.

WHEREAS, the health of the people is largely dependent upon the purity of their food and the reliability of their medicine, and is injuriously affected by the adulterations now so common in very many of the articles in daily use; and

WHEREAS, a bill to prevent such injurious adulterations, introduced by the Hon. Mr. Brosius, is now pending in Congress; therefore be it

Resolved, by the North Carolina Board of Health and the Medical Society of the State of North Carolina, in conjoint session assembled, that our Senators and Representatives in Congress be requested to give this measure their prompt and cordial support.

IN REGARD TO OUTSIDE INSANE, BY DR. HENRY W. LEWIS.

WHEREAS, recent official reports from the State Board of Charities show that there are in North Carolina, uncared for in asylums or other proper institutions, insane, epileptics and idiots to the number of eight hundred and sixty-six, and that there are probably as many more in the State who have not been reported; and

WHEREAS, it is a notorious fact that many of these people are confined in jails and county homes without proper care and attention, and undergo hardships and in many cases maltreatment—which of itself precludes the hope of improvement or recovery from their mental or physical condition; therefore be it

Resolved 1. That the paramount consideration is that these patients have proper treatment at the hands of the State of North Carolina, whereby the reproach now resting on us may be removed.

2. That it being notorious that the State institutions are already overcrowded, we urge the pressing necessity of such early increase of hospital facilities as will insure these proper care and treatment, and to this end we commend the plan referred to by Dr. P. L. Murphy in his paper read before the students of the A. & M. College at Raleigh, March 16, 1900—said plan being known as "The Cottage System."

IN REGARD TO SMALL-POX, BY DR. S. WESTRAY BATTLE.

The total number of cases of small-pox in the State for the year from May 1, 1899, to May 1, 1900, was 2,806, against 616 for the fifteen and a half months preceding—from the beginning of the epidemic on January 12, 1898, to May 1, 1899, an increase of 455.5 per cent. This means innumerable *foci* of infection, which in an indefinite number of instances, owing to entire neglect or imperfect practice of disinfection, are and will continue for months or years still active. Reports from superintendents of health show, on an average, about 10 per cent. only of the people as being vaccinated. The people seem to be generally indifferent or actively opposed to vaccination. The authorities, county and municipal, except in the actual presence of small-pox, do not appear to realize the gravity of the situation and the dangers which menace their people. In view of these facts, be it

Resolved, by the North Carolina Board of Health and the Medical Society of the State of North Carolina, in conjoint session assembled, that it is their opinion that in the present conditions the continued spread of small-pox is inevitable, with the strong probability of its reaching pestilential proportions during the coming winter, small-pox being much more virulent in cold weather;

That quarantine and disinfection in the present state of public opinion, and in view of the lukewarm support, to say the least, too often given the health officer, cannot be depended upon to prevent the spread of the disease;

That the thorough and complete vaccination of all the people is alone adequate to meet the situation;

That this, in most instances, can only be accomplished by compulsion, legal authority for which has been affirmed in the recent decision of our Supreme Court in State *vs.* Hay;

That we feel it to be our duty to notify the people of these facts, and the grave dangers which threaten them, and to call upon those who represent their interests, the various boards of county commissioners, boards of city aldermen and town commissioners, to take at the earliest practicable moment the necessary steps to secure the vaccination of the people, and we urgently appeal to our professional brethren throughout the State, individually, as well as collectively, to render every aid in their power, by both word and act, to the accomplishment of this most important object.

A resolution in favor of establishing the Appalachian Park was introduced and adopted, and copies ordered sent to our Senators and Representatives.

The resolution was as follows:

To the Senate and House of Representatives of the United States of America:

WHEREAS, it having come to the knowledge of The North Carolina State Board of Health and The North Carolina State Medical Society that there is now a movement on foot under the auspices of the Appalachian National Park Association for the establishment of a National Park and Forest Preserve in the Southern Appalachian Mountains, preferably in the Western North Carolina section or adjacent States, to be known as the Appalachian National Park; and

WHEREAS, those interested in this movement having presented a memorial to the Congress of the United States praying for the appointment of a commission to investigate the practicability, feasibility and necessity of establishing such a Forest Reservation and Park in the Southern Appalachian Mountains; and

WHEREAS, the Committee on Agriculture, of the Senate, to whom this matter was referred, having reported back to the Senate favorable upon the appointment of such a commission, and the Senate of the United States having passed the amendment as reported by the Agricultural Committee; and

WHEREAS, we believe that the cause of this Association is one deserving of the most careful attention at the hands of the Government; therefore be it

Resolved, that the North Carolina State Board of Health and the North Carolina State Medical Society indorse the movement of the Appalachian National Park Association, and that we earnestly urge the Senate and House of Representatives of the United States to obtain the careful investigation and report as requested in the memorial set forth by the Appalachian National Park Association.

SANITARY INSPECTION OF STATE INSTITUTIONS.

THE CAPITOL.

His Excellency, GOVERNOR RUSSELL.

SIR:—The undersigned, committee of the State Board of Health, having made a sanitary inspection of the Capitol building, would respectfully report as follows:

We found the plumbing apparently in good condition. The bathrooms, however, having been intended in the original plan, we were informed, for treasury vaults, are far from ideal, being entirely devoid of both light and ventilation, except what of both may enter through two little openings about 10 inches square in the top of the door leading into the hallway. The vault-like effect is increased by the color of the walls, which is very dark and sombre. These conditions, however, are of not much practical moment, as the rooms probably are not often used, and then only for a short time, but we would suggest, for appearance sake at least, that the walls be painted white.

The important sanitary question in connection with the Capitol building is its ventilation, which, to the sorrow of every Legislature, has been found to be practically as defective as it is theoretically. There is one open fire-place in each office, and four in each legislative chamber, with one each in the four rooms for clerks. At present the system of heating is by steam, direct radiators being located under every window. Just under the window-sill and about 18 inches above the floor end, a fresh air inlet flue 8 x 10 inches has been cut through the solid granite wall, closed with cast-iron gratings of rather heavy pattern at both ends, and provided with a shutter valve at the inner end. These inlets were doubtless provided with the idea of ventilating the rooms, but while they are of some use in that respect, they are very ineffective for this reason, that the radiator being situated several inches from the end of the flue, and unconnected with it, and being of itself of a very open pattern (round pipes with wide intervals between), it cannot get any pull on the air—it has no "purchase," so to speak, and the consequence is that the inflowing current of air is feeble. It is, morever, delivered into the room cold, for the reason that it cannot be held against the hot pipes until warmed. For the rooms occupied by the Governor and other State officials, this arrangement will answer very well, as they are very large and airy, with an open fire-place, and are occupied by very few persons. But with the legislative halls, which, from the sanitary point of view, are generally badly overcrowded, it is a very different matter, the various catarrhal troubles being caused not so much by cold as by foul air. The best authorities hold that every adult should have 3,000 cubic feet of fresh air per hour, which means that if the cubic space allotted to him is 750 feet the air must be entirely replaced by fresh air 4 times in every hour, which is said to be the limit short of draughts. By way of illustration, let us take the hall of the House of Representatives. Owing to the curves and other irregularities it is impossible for us to calculate its exact cubic contents, but a liberal estimate would be 120,000 cubic feet. This would give 750 feet each for 160 people, which is probably its minimum population, the number present generally being much greater. To provide properly for this number, the air must be changed four times in every hour, but this cannot be accomplished except by an elaborate and costly system of artificial ventilation. Practically, however, this ideal system is not absolutely necessary, for the reason that the houses are in session only a few hours at a time. Still, for those few hours, the members should have better air, if it can be had. We believe its quality can be greatly improved and at comparatively little expense. To that end we would respectfully recommend:

1. That the present direct radiators in the two legislative halls—nine in number, under the nine windows in each hall, be removed, and direct—indirect radiators with an air-tight connection with the fresh air inlet flues above alluded to be instituted.

2. That the present gratings over the end of these flues be substituted by others of lighter pattern, so as to cause less obstruction to the current of air.

3. That all fire-places be opened, and that in the large hall openings be cut at the floor level in the two hollow square columns, one on each side, and large registers inserted, thereby making them outlet or foul air flues.

4. That during the sittings of the Legislature, fires be kept burning in all the fire places, not for heat but for ventilation, and that a steam coil be operated in the bottom of each of the columns referred to for the same purpose. We are told that this can all be done in both for about $800 to $1,000, and as the Museum is in need of direct radiators for the recent addition, the expense could be materially reduced by placing those discarded there.

We would advise the abandonment of the present method by bucket and chain of drawing water from the open well in the Capitol grounds, and the substitution of a good pump. The infection of drinking water to be dreaded is by the germs of typhoid fever. Any one nursing a case of this disease, or having a mild or "walking" case himself is liable to get his hands more or less soiled with the discharges of the patient. Should such a person draw water from a well rigged as this is, some of the typhoid bacilli would surely be left on the chain and bucket, and at the next descent they would be planted in the water and immediately proceed to develope. This may be considered as a remote danger, but it is a real one nevertheless, and if the well were covered over and a pump or some well fixtures whose parts that reach the water cannot be handled be put in, it would certainly be safer, besides being more convenient.

RICHARD H. LEWIS, M. D.,
A. W. SHAFFER, S. E.,
Committee.

THE SUPREME COURT BUILDING.

We found nothing deserving of criticism from the practical sanitary point of view in this building, except perhaps the method of heating the Supreme Court room itself—by direct radiation. This system, for the offices and libraries, is good enough, but if the court-room should be crowded the indirect system would be better. At the same time we can not say that the requirements of health demand it. It would simply be better.

AGRICULTURAL DEPARTMENT.

An inspection of this building revealed nothing unsanitary. A sewer man-hole under the Museum might come under that head, but work for its closure was in progress at the time of our visit.

A. W. SHAFFER, S. E.,
RICHARD H. LEWIS, M. D.,
Committee.

STATE HOSPITALS FOR THE INSANE.

THE CENTRAL HOSPITAL AT RALEIGH.

DR. GEORGE G. THOMAS, *President N. C. Board of Health.*

DEAR SIR:—In compliance with the instructions of the Board, we have made an inspection of the Central Hospital for the Insane, and beg leave to report as follows:

We found this institution in excellent condition, everything neat and clean and giving evidence of excellent management. We would, however, suggest a few improvements.

The old cement floors in the lavatories are cracked and therefore unsanitary. We would recommend their replacement with slate.

Some of the bedsteads are of wood and without springs. We would advise the substitution for them of iron bedsteads with woven wire springs.

The floors from the repeated oilings of years have become rough in places from accumulations of dried oil, and catch dust. They should be scraped and paraffined.

The partial water supply from Rocky Branch is bad, receiving as it does above the intake, the drainage of one or more slaughter-pens and sewerage from the A. & M. College. While this water is not used for drinking purposes, it should not be used for any purpose. We would urge its abandonment as soon as better water can be obtained.

The plumbing, so far as we could judge, without the use of special apparatus with which the Board is not provided, is in good condition.

THE DEPARTMENT OF THE CRIMINAL INSANE.

By act of the General Assembly of 1899, the unfinished western wing of the Penitentiary was ordered completed, and set apart for the accommodation of dangerous lunatics. Aside from the question of sentiment arising from the fact of its being a part of the Penitentiary building, it seems well enough adapted to the purpose. But the question of sentiment in the management of the insane is one that should not be ignored, and a different location is, therefore, desirable.

The four wards, one above the other, with sleeping rooms on one side, are large and well lighted, and while not ideally ventilated, the air space for the present number of inmates is so liberal as to practically remove objection on that score.

The water-closets we found in very bad condition. The closets themselves are perhaps good enough, but the *sine qua non* of water to operate them was, at the time of our visit, and according to the attendant in charge, generally, lacking. On attempting to flush them we obtained a feeble trickle of water on the first floor, entirely insufficient, but on the three floors above, not a drop. The fecal odor was quite pronounced, notwithstanding the free use of disinfectants. It is useless to say that this condition of affairs should be immediately remedied.

We would also recommend that the present plank floors in the lavatories, which are loose and irregular in places, be replaced with some non-absorbent material as slate, or at least be relaid and paraffined.

A. W. SHAFFER, S. E.,
RICHARD H. LEWIS, M. D.,
Committee.

THE STATE HOSPITAL AT MORGANTON.

THE HONORABLE, THE BOARD OF DIRECTORS,
State Hospital, Morganton, N. C.

GENTLEMEN:—In response to your request, and in compliance with our duty under the law, we, the undersigned, a committee of the State Board of Health, made an inspection of the institution under your care, inquiring particularly into the probable cause of three cases of typhoid fever among the patients, the water supply and the crowded condition of the wards.

Typhoid Fever.—We must admit that we were unable to definitely locate the origin of the disease. We could not trace it to any influence peculiar to the Hospital, however. The very small number of cases of itself was conclusive evidence that no cause common to any large number of the inmates could be operative. Our conclusion is rendered more probable by the fact that two of the three cases were allowed outside liberty, and as typhoid fever is endemic in the mountains of our State there is simply no telling how they were infected. The third case, which was strictly confined, was peculiar in some respects, and from the statement made to us by the attending physician, might, as he suggested, have been some other disease.

The Water Supply.—While the supply now available is perhaps sufficient for the present actual needs of the Hospital, it is very desirable, to say the least, in all institutions of this character the supply of good water should be more than just enough for actual needs. In view of this and of the probable increase in the near future of your population, which would make more water a necessity, we would suggest that immediate steps be taken looking to an augmentation of your supply. Upon inquiry we learned that additional water would have to be obtained from one of three sources—bored wells, Hunting Creek or Long Branch. Owing to the uncertainty of the amount and continuance of flow from bored wells not strictly artesian, and to the danger of contamination of Hunting Creek from the settlements upon its water-shed, it appeared to us, on general principles, that Long Branch was the most desirable source. We, therefore, in company with your Superintendent and Engineer, made an examination of that stream and, to some extent, of its water-shed, at the same time inspecting the source of your present supply, Black Fox Branch. In regard to this latter we take pleasure in saying that but for its limited quantity it would be altogether ideal. Long Branch, with nearly three times the volume of Black Fox, would be equally as good but for two or three settlements on its water-shed. As it was, we were very much pleased with it as a supply.

We would recommend specifically:

1. That the present water supply be materially increased as soon as possible.

2. That a pump connected with the present pipe line be located on Long Branch just above its junction with Black Fox, not only to lift its waters over the highest point in the line, but by the addition of a *vis a tergo* to the present force of gravity to increase the rapidity of current through the pipe—which is, of course, necessary to an increase of delivery.

3. That, if possible, the water-shed of Long Branch be purchased in its entirety while lands in that locality are cheap and all human habitations removed.

4. That, failing in this, a competent man residing in that immediate

neighborhood, if he be obtainable, be employed to run the pump and guard the water-shed. Being on friendly terms and in sympathy with his neighbors, and living very near the water-shed, he would be much more likely to secure protection from contamination than would an occasional inspection from the Hospital.

The flow of this stream, we learn from Dr. Murphy, is about 350 gallons per minute, which probably represents the minimum, as the measurement was made during a dry time in the fall. This added to that furnished by Black Fox—150 gallons per minute, say—would represent a supply for twenty-four hours of 720,000 gallons. This would constitute an ideal water supply certainly sufficient for many years to come, and probably for all time, as the population of the institution is not likely to reach a higher figure than 3,600.

While we hardly think the gangwells now in use can be contaminated, still they are below the barn, and it might be as well to disconnect them from the other supply and utilize them for filling the reservoir for fire and purposes other than drinking. We do not insist on this.

Overcrowding.—We regret to say that we found too many patients for the legitimate capacity of the Hospital, there being in some of the wards nearly twice as many as were provided for in the design. It is needless to call the attention of your honorable Board to the fact that overcrowding is one of the unpardonable sins in hospital management, as we feel sure that you are already aware of it and have yielded your better judgment only under duress—in response to the heart-rending cries for help that come to you from all quarters. This overcrowding is not only detrimental to the general health, thereby interfering with the specific recovery of the present inmates, but it leaves no room for the reception of acute cases that could be cured if promptly brought under proper care and treatment—cases which if neglected for any length of time are apt, in too many instances, to become hopeless. But unfortunately consignment to a life of mental alienation is not the only consequences of lack of prompt treatment. In no inconsiderable number of cases—23 now in your institution, we are informed, and how many that have never been able to secure your protecting care it is impossible to say—women in the early stages of their affliction are debauched. As is well known undue prominence of the sexual instinct is a frequent accompaniment of insanity, the patient has lost her self-control, she is not responsible, she cannot give consent, for morally she is a child, and whatever may be the legal construction of the offense it is essentially *rape*. The mere mention of this crime stirs to the depths the soul of every man worthy of the name. We stop at nothing to punish the offender and to prevent its repetition, and yet, indirectly, in the manner indicated, to save a few dollars, we expose to this deepest degradation the most helpless class of our women, those who above all others have a right to demand protection from the State. It will not answer to say that every family should guard its own, for the true condition of the afflicted one in this respect is not always known, and the conditions are such in many families, where every one is of necessity a bread-winner, that proper protection cannot be afforded.

It is unnecessary for us to give the many other forcible reasons why all the insane should be provided for, but we can but feel that our legislators have not fully realized how urgent the need for more accommodations for this pitiable class of our people is, and that when they do they will provide for them.

We cordially approve the proposed cottage plan for the settlement and use of the milder cases now in the Hospital. In company with your Superintendent and other officers of the institution we carefully went over the various sites suggested for the location of such a building and decided that, looked at from every point of view, that situated between the road leading to the meadows on Hunting Creek and the present slaughter-pen was best adapted to the purpose.

General Inspection.—We found the buildings and grounds in their usual excellent condition, the only exception noted being the consequences of the overcrowding referred to above, and were impressed, as we have always been in our visits of inspection, with the admirable management that has characterized the institution from its foundation.

George Gillett Thomas, M. D.,
Richard H. Lewis, M. D.,
Committee.

THE EASTERN HOSPITAL AT GOLDSBORO.

Dr. George G. Thomas,
President North Carolina State Board of Health.

By your appointment, we on July 13th made a sanitary inspection of the State Hospital at Goldsboro, and we respectfully beg leave to report:

We found every evidence that Dr. Miller and his assistants had been putting forth much effort to keep the Hospital, out-buildings and premises as a whole in a good sanitary condition.

The floors to halls and wards of main building looked clean from the frequent dry-sand scourings to which they had been subjected. The walls generally were beautifully white, though rough, from long repeated applications of "white-wash." Sulphur gas is used occasionally to disinfect the wards, and the inmates are made to practice bathing at frequent intervals.

Notwithstanding great diligence along these lines is being pursued, yet the smell of urine and the odor associated with overcrowding are clearly perceptible and the stain of sputa marks the floor and walls of some of the wards.

Our criticism as to the floor is this: Notwithstanding its double thickness it is made of porous material, and is in many places rough, badly worn and marred by large fissues between the planks, which have become filled with dust. Such a floor is thoroughly absorbant and will, in an institution of this kind, in spite of every effort to the contrary, become contaminated with sputa, urine and other filth. Much could be added to the healthfulness of the Hospital, if after properly repairing and polishing the floor, it were periodically subjected to at least two coats of enamel paint. From a sanitary standpoint a floor thus kept is well-nigh non-absorbent, easily washed, and therefore far preferable to an unpainted one, no matter what method of washing or rubbing may be used.

The walls, though kept as a whole nicely white by periodic lime washings, are not the best. The method is objectionable from the fact that the walls become rough and scaley, thus affording a splendid chance for the accumulation of dust and a hiding place for infectious germs. Besides, lime soon looses its antiseptic powers. A much better wall is one of hard plaster, capable of being well rubbed down, polished and painted, and washed every few months with some disinfectant liquid if need be.

The institution is badly overcrowded. Tubercular patients are from force of circumstances made to occupy wards along with the non-tubercular. This is a sad truth, and demands correction.

The drinking water for these 460 inmates, judging from their past exemption from "drinking water diseases," is decidedly healthful. Yet on account of the close proximity of the stables of several horses and a great many milch cows (only a few yards distant) to the well, the water stands in great danger of contamination; for its purity is at any moment liable to be impaired by the sudden soakage of foul liquids through the soil.

(Signed) J. L. NICHOLSON, M. D.,
ALBERT ANDERSON, M. D.,
Committee.

STATE SCHOOLS.

THE UNIVERSITY.

TO THE HONORABLE, THE BOARD OF TRUSTEES.

GENTLEMEN:—On January 31st, the undersigned, a committee of the State Board of Health, in compliance with the provisions of section 3 of the Act in Relation to the Board of Health, chapter 214, Laws of 1893, made the usual sanitary inspection of the institution under your charge and respectfully beg leave to report as follows:

We were cordially received by President Alderman, and all the facilities for making the investigation requested were cheerfully furnished.

The general sanitary conditions, with one notable and one minor exception, we found very satisfactory.

It was suggested that the mode of heating the dormitories—wood fires in open fire-places—was antiquated, inconvenient, expensive and in very cold weather inadequate, causing often decided discomfort, to say the least. These criticisms are doubtless well-founded, but at the same time it remains equally true that from the hygienic point of view the open fire-place for heating and ventilating living and sleeping rooms has never been improved upon, if equalled, in this climate. The rooms are large and airy with abundant air-space for the two students occupying them and thoroughly ventilated by the chimney draught. They are, moreover, very well lighted. The "Spartan simplicity" which almost universally obtains in their furnishing—the general absence of carpets, those great germ collectors, and of heavy window curtains keeping out the pure air and purifying sunlight—while it does not appeal, we must admit, to the æsthetic, it does to the sanitary eye, under which aspect we have considered the subject.

The notable exception to the generally good sanitary condition referred to is the totally inadequate water supply. Upon going to inspect the lavatory we were surprised to find the door locked. Asking the cause, we were informed by the janitor that the water was out. An attempt to flush the water-closets verified the statement. Owing to the same cause the baths had fallen into practical disuse. The bearing upon the general health of cleanliness of the person and of regularity in the bowel functions is so well known that it is unnecessary to dwell upon it further than to say that in our judgment many a student in the past has suffered in health from habitual constipation, the foundation of which was laid by the irregularities resulting from the discomfort and inconvenience of the necessary walk into the woods in cold and rainy weather. The researches of modern medical science have shown the evils of constipation to be much more serious and far-reaching than was formerly supposed.

The present water supply which is obtained from two large wells in the campus, fed, it appears from investigations heretofore made, solely by the ground water of the plateau on which the college buildings are situated is even now, in winter, entirely insufficient, and as the level of this ground water must be gradually lowered by the constant pumping it is only a matter of a few years when it will be practically exhausted. The subject having been brought to the attention of the last General Assembly, an appropriation of $7,500 was made to provide a new and adequate water supply. Upon inquiry of President Alderman, we learned that the plans and specifications for a system narrowed down to the lowest notch had been prepared by Mr. Ludlow, the sanitary engineer of Winston, but that its construction could not be accomplished with the means provided. The proposed source of supply, Bolling's Creek, above the railroad crossing, a rapid stream derived from a sparsely settled and largely wooded water-shed, brawling over a rocky bed, we cordially commend as being as near perfection as is obtainable in the environs of

Chapel Hill. We beg to say, however, that while the plan of the waterworks is generally excellent, it is, in our opinion, defective in having no provision for filtration of the water and in being too restricted in its distribution—to conform, no doubt, to the meagre appropriation. The chief object in installing the water supply is to protect the health, add to the comfort and foster the self-respect of the student body. According to the present plan, which, as we understand it, delivers water only to the one general lavatory and to the laboratories, this object cannot be fully attained. There should be in every dormitory building one or more baths and at least one water-closet for use in case of sickness and at night in bad weather.

Another aspect of the water question in its relation to the student body is this: Owing to the lack of dormitory accommodations in the buildings nearly one-half the students reside in the village and about four-fifths take their meals at the various hotels and boarding-houses. As is well known, a large proportion of the water drunk is taken with the meals. A proper consideration of the water supply therefore must include that of the village. This latter is obtained entirely from wells. Wells, especially in towns, are very liable to infection. This infection is brought about usually in one of two ways—by seepage through the soil into the well from nearby unsanitary surface privies and by direct contact of contaminated hands with the bucket and chain, almost universally employed in open wells. It is not difficult to understand how this infection can be accomplished by a patient with a "walking case" of typhoid fever, or by a nurse of a case of that disease. It follows, therefore, that wells should, whenever practicable, be superseded by a safer supply. A slight amplification of the present plan in running small laterals from the main conductor pipe to drinking fountains, within convenient distance of most of the hotels and boarding-houses and the addition of an approved filter—which latter should by all means constitute a part of the system in any event—would practically accomplish this. In our judgment this amplification is very desirable and filtration of the water should undoubtedly be provided for. The stream furnishing the water would be unfit for use unless it were filtered during a large part of the winter and spring when the University is in session.

We have dwelt upon the subject of water supply because the one dangerous disease of all others against which college students should be protected is typhoid fever, the poison of which is in an immense majority of cases introduced into the system through the drinking water. The recent dreadful scourge of the State Normal and Industrial College by this disease, caused by an infected well, enforces our contention far more eloquently than anything we could possibly say.

The minor exception alluded to in the beginning of this report is the lack of water facilities in and the location of the Infirmary. It is unnecessary to dwell upon the importance of bathing facilities in a hospital, nor upon the desirability of quiet surroundings, and, in case of contagious disease, of sufficient distance from other inhabited buildings. During the current session these two last points have been emphasized by a dangerous relapse in a case of typhoid fever occasioned by the noisy hilarity of a body of passing students, and by the inconvenience and more or less uneasy feeling, to say the least, arising from the recent case of small-pox. In passing, we feel constrained to say that we cannot commend too highly the admirable and successful management of this outbreak of small-pox by the authorities of the University, nor the manly and sensible behavior of the students in relation thereto.

RECOMMENDATIONS.

We would respectfully commend:

1. That every effort be made to install as soon as possible the proposed water-works. That the plans already made be amended by the addition of an effective filter and by its extension in part to the village as indicated in the body of this report.

2. That steps be taken to secure the sanitary supervision by the authorities of the University of the premises of all hotels and boarding-houses patronized by students, with a view especially to the protection from contamination of the wells used by them. This supervision could, of course, be exercised with the consent of the proprietors, but we feel sure that the privilege would be freely granted. Should there be objection on the part of any of them, however, we would suggest that a list be made of all hotels and boarding-houses permitting inspection and carrying out in good faith the directions given for their sanitary care, and that said list be furnished to all students immediately upon arrival and be also sent to their parents or guardians. Believing in as little interference with private affairs as a due regard for the public health will permit we think it would be sufficient to confine the supervision to the protection of the drinking water. To this end these three things should be insisted on: (a) That no privy be allowed within one hundred feet, at the very least, of any well; (b) That the Rockford, or tub and dry-earth, system be applied to all surface privies, and that the tubs be emptied with sufficient frequency; and (c) That all open wells be closed and a pump be substituted for bucket and chain. To no well in the whole town is this last suggestion so applicable as to the old college well in front of the South Building, the waters of which are drunk by every student. As it stands, it can be infected, but if closed in and fitted with a pump it would be, we believe, impossible, and no sentimental regard for "the old oaken bucket" should prevent the change.

3. That the Infirmary be moved to a more retired part of the campus and that it be supplied with water facilities as soon as practicable.

George Gillett Thomas, M. D.,
Richard H. Lewis, M. D.,
Committee.

STATE NORMAL AND INDUSTRIAL COLLEGE.

The inspection of this institution was of peculiar importance and interest, owing to the very serious outbreak of typhoid fever among the students in November, 1899. In addition to the report of the regular committee of the Board, extracts from the editorial columns of the monthly BULLETIN for November and December, 1899, embodying the history of the epidemic, and the report thereon made to the public through the newspapers at the request of the Board of Directors of the College by the Secretary of the Board of Health, are given below:

DR. GEORGE G. THOMAS,
President State Board of Health.

DOCTOR:—Pursuant to your order designating the undersigned to make the stated annual inspection of the Normal College and the A. & M. College at Greensboro, supplemented with a hurry order on Saturday last, on account of a threatened epidemic of typhoid fever at the first named institution, we beg to report progress and proceedings as follows, to-wit:

We reached Greensboro Sunday night and the Normal College early Monday morning, November 19th. Three deaths had occurred during the previous week and some sixty or seventy students were on the sick-list. The exercises had been closed that morning; all who were able to travel had left, or were leaving, as rapidly as possible, and the diagnosis of typhoid fever was very generally accepted.

Under these conditions, we thought best to devote as much of our time to the sewerage and drainage system as possible, and in reply to our request for a diagram of the grounds, buildings and drainage system, were informed that there were none at the institution, and so far as known, none existed. So with the best assistance obtainable, which was freely given, we repaired to the grounds. The surface about the buildings and moist places everywhere was covered with carbolic acid and lime, and a party of plumbers from Odell's plumbing shops in Greensboro was engaged beneath the buildings at the northeast corner of the college grounds, taking out the underground drain, or sewer pipe, shown on the accompanying diagram as starting at the northwest corner of the dormitory, passing beneath the scullery and entering the "new sewer" at a distance of about 17 feet. A rough sketch of the second floor of these buildings, kindly furnished by Mr. Hannah as we came away, shows that this pipe receives the drainage from the bath-rooms and closets of that floor. If it had any other connection it had not been found when we left at 12 o'clock the next day. The operations at this point had been induced by the detection of offensive odors there in the search for a possible cause of the outbreak of fever on the Saturday preceding our arrival. The upper end of the pipe referred to (5 feet) was of iron, followed by twelve feet of earthenware pipe. The joints of these earthenware pipes were leaking, and the earth in the trench was saturated with the drainage, the pipes soaked through and rotten. These were replaced by the plumbers with iron pipes, lead-jointed.

Formerly, all the sewage and drainage of these buildings ran down the "old sewer" and the "roof and kitchen drain" shown on the diagram, and emptied into a small stream having its source near the grounds and running along the east boundary northward. About four years ago (1895) the new sewer was put in, emptying into a somewhat larger stream, having its source on the west side of the grounds and running northerly, like the other. The mouth of this sewer was about half a mile away, while the first was but a few hundred feet. The drainage of these buildings was supposed to be turned into the new sewer and the old sewer and drain sealed up and abandoned.

Inspecting the stream on the west side of the grounds, we passed down to the mouth of the new sewer and passed over to the stream on the east side, striking it at a considerable distance below the mouth of the old sewer, where we were surprised to find offensive odors and the stream loaded with a substance of offensive odor that covered its bed everywhere. At the mouth of the pipe we found a small stream of discolored water flowing from it, and having the same offensive odor. The water of the stream above the mouth of the pipe was clear, the bed free and the air sweet. We returned to the grounds or campus, and a party was set to work opening the pipe at the point where the old sewer received the drain-pipe from the east front of the building on the north side of the street. The first was dry, and the second carried the same stream and offensive odor. So we crossed the street and opened the drain-pipe at a point between the power-house and kitchen, where the stench was so great that they had to fill up the opening and first expose a considerable length of pipe, then smash and leave it to "aerate" for a while, and in that way the work was being carried up along the wall of the kitchen with intent to follow it to its source or head, raze the whole system and change the connections into the new sewer. When we left next day this pipe was pointing in a dead straight line for the meat-house, against the north wall of the great dormitory, in the floor of which, where shown, was a drain recently closed, and the floor strewn with carbolic acid and lime because of the offensive odors found in the room. Everybody, we think, believed, certainly nobody present denied, that this opening, together with the five down pipes from the roof and the kitchen drain entered the drain-pipe, and that the meat-house opening was the head of it. Upon our return home we received by wire from the President the information that later developments show that this opening does not enter the drain, but enters another pipe running eastward into the garden. Unfortunately this error of inference got into expansive circulation, and if it keeps on growing can only be stopped after it has dumped all the college sewage into the meat-house.

The water used at the College is obtained from three wells on the grounds and the city water-works. A chemical analysis has been very recently obtained from the State Chemist, in which the water from the wells is reported as free from deleterious chemical matter and that from the city water-works "very bad." The bacteriological analysis—requiring more time—had not been received, and we are therefore unable to make any report upon the question of typhoid germs in the water. The well nearest the defective pipe—about one hundred and twenty-five feet—is about ten feet above that pipe at the surface of the ground. It is sunk through some fifteen feet of earth and the remainder is blasted through solid rock. It has, however, been temporarily dismantled and closed.

We found the inside face of exterior underground basement walls discolored with water passing through the walls, and the east basement of the Administration building, used for chemical purposes, we believe, had standing water on the floor in one corner, a prolific source of rheumatism.

The plumbing, notably in the dormitories, has been bad. The ceiling beneath almost every lavatory and bath has been saturated with water, the plastering has fallen and been replaced. Later the plumbing seems to have been repaired, and the ceiling, though stained, is dry.

A very considerable increase of students this year has filled the dormitories, we think, beyond their normal capacity for health or comfort. Rooms having a capacity of 2,000 cubic feet have two students. Others with a capacity averaging 2,400 cubic feet have three students, and others of 3,200 cubic feet and upward have four students, while corner rooms, with three to four windows and less space, have also four students. These measures are more approximate than accurate, but as many students have two trunks, it seems plain that when the necessary beds, tables, chairs, desks, stands, lavatories and book-racks are in place there isn't much room or floor space left to turn about in.

The dairy farm, the barn, stables, cattle-yards and piggeries are all located on a third water-shed, draining into a third stream on the west, running parallel to the others, only the dairy building proper being on a small spring-branch running eastward and emptying into the middle stream above the mouth of the sewer. We found this department in excellent order and condition throughout, except, perhaps, that the wire fence dividing the stock pasture from the stream carrying the sewage from the College ought to be strengthened; so as to prevent all possibility of the cattle reaching that stream through or over the fence.

It is scarcely necessary for us to add that in the performance of our assigned duty we have had the full, free and cordial support and assistance of the President and every officer of the institution, though sorely oppressed with the constant labor, care and sorrow brought upon them by a sudden and terrible affliction.

We beg to submit to the Boards, and commend to the favorable consideration of the College faculty, the following suggestions and remarks, most of which were communicated orally to Dr. McIver, President, and some of which were being carried out on the grounds when we left;

1. That all the "old" sewer and drain pipe be traced up to their heads by exposure of the pipe; all sewage and waste from the buildings turned into the new sewer, and all the sewage and drainage-pipes of the old system, not wanted to carry surface water alone, dug up and removed, and the old connections sealed.

2. That the stream into which the new sewer now discharges be straightened and deepened from its head in the college grounds to the northern limit of the property, and the brush on its banks for the space of five feet or more be eradicated and so maintained.

3. That the exterior face of all brick walls inclosing an underground room or basement used by students or employees be trenched from the surface of the ground to the bottom of the first brick course, the walls thoroughly cleaned of all earthy matter, the joints opened if of lime mortar, the brick wall wetted down and a plaster coat of one part Portland cement and three parts clean, sharp sand applied from first course of brick up to and above the ground line, and *well trowelled*, then refill and ram down well the clay in the trench as soon as the plaster has set.

4. Strengthen the wire fence along the east side of pasture so as to make impossible any access of the stock to the stream carrying the college sewage, as hereinbefore suggested.

5. That a topographical survey and diagram be made, showing the ground plan of every building, sewer and drain-pipe, well, hydrant, fountain, tank, water supply pipe, cistern, drive or walk on the college campus proper. This can be easily and cheaply multiplied by photo-lithography for the use and information of all concerned, including the State Board of Health.

Remarks.—All well water is at its best when most agitated and aerated, and the best known agitator is an endless galvanized chain with galvanized disk cups attached, passing downward free, turning on a wheel fixed at the bottom, and rising to the point of discharge through a cucumber wood pipe.

2. No conductor pipe made of red clay, within the knowledge of the writer, is fit for conducting sewage. It cracks in the baking or burning,

leaks and rots when the salt glaze is destroyed, and, however low the first cost, is the dearest sewage conductor pipe on the market.

All of which is respectfully submitted, this 24th day of November, 1899.

HENRY H. DODSON, M. D.,
A. W. SHAFFER, S. E.,
Committee.

RALEIGH, January 28, 1900.

DR. GEORGE G. THOMAS, *President, etc.*

DEAR SIR:—Pursuant to orders, I made the final inspection of the changes, repairs and improvements lately inaugurated at the State Normal and Industrial College, Greensboro, N. C., on the 26th inst.

I found all the earthenware sewer and drain-pipe beneath the buildings replaced by iron pipe, hemp-caulked and lead-jointed, and all the saturated clay about the point of leakage removed and replaced with dry sand. The northeast, or central, well and that at the Teague house and the one at the wooden dormitory had been filled up and abandoned. All four of the buildings facing the street south of the College grounds—sometimes occupied by the college students—are now using city water for all purposes, and are connected with the College sewerage system. The meat-house and the butter-closet have been discontinued, and a new meat-house is building in the open ground near the old site, to which are added improvements in the nature of cold storage.

For purposes of disinfection with formaldehyde two Kny-Scheerer Co. generators were purchased, together with five carboys of formalin. Sixteen ounces of solution of calcium carbide and formalin were consumed for every 1,000 cubic feet of space in sealed rooms, halls, closets, passages, etc., throughout the buildings. All the plastered walls and ceilings have been fresh calsomined and all the wood-work washed with a 1 to 1,000 solution of bichloride of mercury, and, with the exception of the Administration building, repainted or varnished. The old bedsteads and mattresses are replaced with new and single ones, and all the bath-tubs are new, open, iron, porcelain-lined, in rooms well heated and ventilated.

One large Loomis-Manning water filter had been ordered but not yet arrived, having a guaranteed capacity of 20,000 gallons a day, which was estimated to be ample for the filtering of all the water used upon the College grounds for any purpose short of flushing and irrigation, including the dairy and stock-yards. There will also be provided four Waterhouse-Forbes patent water sterilizers, one for each dormitory, the dining-room and the Administration building, through which all drinking water will be passed before use. One of these is now in place and operation near the dining-room.

The exterior walls of all underground rooms designed for use have been trenched to the foundation brick-course, the face cleaned and wetted down and a coat of strong Portland cement-plaster applied; the trench refilled, rammed down, and the surface graded to a water-shed from the buildings, as heretofore recommended; and everything heretofore recommended has been accomplished except the clearing up of the west water-run, and the preparation of a diagram of the College buildings, walks, drives, sewerage and drainage system, etc.

President McIver assured me that as soon as the filter could be put in operation he would draw and send to Dr. Anderson for analysis a sample of so filtered and so sterilized water, and report the result to the State Board of Health.

All which is respectfully submitted.

A. W. SHAFFER, *S. E.*

[*From the Bulletin for November, 1899.*]

TYPHOID FEVER AT THE STATE NORMAL AND INDUSTRIAL COLLEGE.

It is with deep regret that we note the outbreak of typhoid fever at the State Normal and Industrial College for Women at Greensboro, on such a large scale as to cause the suspension of the school. We believe this institution to be one of the greatest powers for good in North Carolina, and the present condition of affairs can only be regarded as a public calamity.

About three weeks ago cases of sickness began to occur which were supposed to be malarial fever. They became so numerous, however, that President McIver asked for an inspection and advice from the Board. The committee already appointed by the President of the Board to inspect, in regular course, the State institutions at Greensboro, the Normal and Industrial College and the A. and M. College for the colored race, composed of Dr. Dodson and Colonel Shaffer, were promptly notified by wire, and in person and with equal promptness responded. They have not yet made their report, and, indeed, cannot do so until the report of the bacteriologist on the water supply is received. The only thing discovered by them in their personal inspection of the premises was a leaking soil-pipe from ten water-closets in the main dormitory, which had saturated the soil in the basement under the butler's pantry, and within eighteen inches of an opening in the wall of the butter-room. This leak was located and remedied just before their arrival. In the absence of other apparent cause this was generally regarded as the probable origin, but no opinion can be given, of course, until we hear from the bacteriologist, as infected drinking water is so much more likely to be the cause in an immense majority of cases of typhoid fever.

It should be said, in justice to the city of Greensboro, that the cause, whatever it may prove to be, seems to have been strictly local, as students boarding outside have not been affected, the sickness being confined to those sleeping and eating in the buildings.

According to our latest information there have been about one hundred cases of sickness, with three deaths, but while some are convalescent, there are very many still sick, and the final result cannot yet be foretold.

We sympathize most sincerely with the stricken young ladies and their parents and friends, but with none more than with the devoted President of the College, Dr. McIver, who, we verily believe, carries them all on his heart. But, as we understand it, no blame whatever can be attached to him, or the management, and we feel confident that by the re-opening of the College on January 2, 1900, everything will be in better shape than ever before, and that the students can return with perfect safety.

"Great epidemics are great reformers," it has been said, and while this outbreak cannot be classed in that category exactly, it is such from the point of view of the College. We have deplored in these columns for years the discouraging indifference of our people to the importance of sanitation. But they are being taught. The small-pox epidemic of last winter and spring, mild as the disease generally was, has made a decided impression on the public mind, and this striking and tragic object-lesson in an institution having representatives from every county in the State save one, we believe, will spread and deepen still more this impression. As the ultimate consequence of this present affliction we believe it not unreasonable to assert that hundreds of lives will be saved in our State. It has prepared the ground, and seed sown on good ground can be counted on to bring forth some thirty, some sixty and some an hundredfold.

In this connection we think it opportune to call the attention of the people (we hope the newspapers of the State will aid us in giving it publicity) to a provision of the act of 1893, that, we regret to say, has been almost invariably honored in the breach rather than the observance by the parties interested—so far as the State Board of Health is concerned, at any rate, though the advice of local boards may have been sought. It is section 19, chapter 214, Laws of 1893, and reads as follows:

"SECTION 19. The said board shall from time to time consult with and advise the boards of directors of all State institutions, the authorities of cities and towns, corporations or firms already having or intending to introduce systems of water supply, drainage or sewerage, as to the most appropriate source of supply, the best practicable method of assuring the purity thereof, or of disposing of their drainage or sewage, having regard to the present and prospective needs and interests of other cities, towns, corporations or firms which may be affected thereby. All such boards of directors, authorities, corporations and firms are hereby required to give notice to said board of their intentions in the premises and to submit for its advice outlines of their proposed plans or schemes in relation to water supply and disposal of sewage, and no contract shall be entered into by any State institution, city or town for the introduction of a system of water supply or sewage disposal until said advice shall have been received and considered: *Provided, however*, that any city or town having a regularly organized board of health may seek advice therefrom or from its county board of health in lieu of that of the State Board."

Since the above was written we have spent several days at the College and a full report will appear in our next issue. Suffice it to say, for the present, that the first cases, to the extent of about sixty per cent. of the whole number, were undoubtedly malarial fever, all recovering in from four to ten days under quinine; that the total number of deaths to December 1st is seven; and that two of the wells used for drinking purposes, including the central well used by all the students, have been found by the bacteriologist to be infected.

[*From the Bulletin for December, 1899.*]

THE OUTBREAK OF FEVER AT THE STATE NORMAL AND INDUSTRIAL COLLEGE.

(CONTINUED).

In our last issue we made a preliminary statement in regard to the subject set forth in the title of this article, and promised to give in the present number of the BULLETIN a fuller report. To meet the deep and widespread interest felt in this matter as promptly and thoroughly as possible, we prepared for the press, at the request of the Directors of the College, a report which appeared in the morning papers of the State on December 3d. As another report would necessarily be mostly repetition of that, and as many of our readers doubtless did not see it, we reprint it. To those who have read it we would suggest skipping to the "Supplementary Report," in which will be found certain new facts of interest and value obtained since the original report was written. The report of December 3d was as follows:

The recent outbreak of fever at the Normal and Industrial College at Greensboro has excited in the hearts of the people of the whole State the deepest sympathy and concern. The greatest interest in the origin of the epidemic is naturally and properly felt by all. Rumors have been started having no basis in fact. To correct any misapprehensions, and for the information of the people of the State, the Board of Directors, at a meeting held at the College on November 30th, requested me, as Secretary of the State Board of Health, to prepare and give to the press an official statement of the facts as ascertained to date. I was instructed to be perfectly frank, concealing nothing, If, therefore, anything of importance should happen to be omitted from this statement the reader may rest assured that it was not intentional, but the result of a poor memory, or the hurry that very busy men cannot always escape.

Learning Friday night (November 24th) that the Board of Directors of the College would meet on Monday, and knowing that the committee of the Board of Health which made an investigation early in the week would not be able to get in their formal report in time, I felt it to be my duty, as the executive member of the Board of Health, to make a personal investigation and be prepared, as far as possible, to enlighten and advise the Directors if desired by them.

Accordingly, I repaired to Greensboro early Saturday morning, and remained there until Tuesday morning, spending the whole time from breakfast to bed-time, except Sunday morning, at the College.

After talking over the whole matter with President McIver, my first inquiry was

"THE NATURE OF THE FEVER."

Requesting an interview with the physicians in charge, it was promptly accorded, and I had a very full and satisfactory conference with Dr. Gove, the resident physician, and Dr. W. P. Beall, the chief consultant, which convinced me beyond doubt that the first cases, about sixty of the total number of one hundred cases, beginning about October 25th, were malarial in character. For the benefit of the medical reader, I will state that this conclusion was based upon the description of the attack given by the doctors, the presence of the plasmodium malariæ in the blood of six of the eight cases whose blood was examined microscopically (I verified this by a personal exexamination of two specimens that had been kept), and recovery in from four to ten days under quinine. The remaining forty cases in round numbers were clearly typhoid fever. Of this number about ten seemed to have been the subjects of a double infection, with both malarial and typhoid, and the remainder uncomplicated typhoid, typical in character. I was also informed that the sickness was strictly limited to students who ate and slept in the College.

Having satisfied myself as to the nature of the sickness, my next step was to ascertain, if possible, the cause or causes of both. We will first consider

THE MALARIAL FEVER.

The only thing about the premises I could find at all likely to produce malaria was a narrow marshy valley, carrying a very small stream—so small as to be scarcely perceptible in places—immediately in the rear of the row of buildings composed of the President's house, the wooden dormitory, the Infirmary and the horse-stable. Upon inquiry, I also learned that mosquitoes had been very abundant.

But in this connection it should be said that malarial diseases have been unusually prevalent this season in the hill country of the State. The reports from the county superintendents of health for September, published in the monthly BULLETIN of the State Board of Health for October, showed malarial fever present "in all parts" of Alamance, Cabarrus, Caswell, Davidson, *Guilford*, Mecklenburg and Rowan. It is fair, therefore, to assume that some of the students brought the malaria with them from home, but others, perhaps many, were unquestionably affected at Greensboro, as at least two girls from the mountains had malarial fever. [Malarial fever, I learned, had also been very prevalent this fall in the houses to the northwestward of the College, the nearest case occurring in September in a house not more than two hundred yards distant.] Information obtained on a subsequent visit.

It should not be forgotten that this has been an exceptional year for malaria in the middle section of the State.

THE TYPHOID FEVER—ITS CAUSES.

Typhoid fever is essentially a filth disease, the germ of which is known as the bacillus typhosus, a motile, water-borne bacterium, which once introduced into water, or milk, or moist filth reproduces itself with fearful rapidity by fission or splitting in half. The media of transmission of this germ are in the order of their importance, water, milk, insects (flies) and air (?). While many high authorities, chiefly English, believe in the aerial transmission, the weight of opinion is against it. But all agree that in an immense majority of cases it is conveyed by contaminated water, or milk infected by such water used in adulterating it, or in washing the cans or the udder of the cow, or by the hands of a not overcleanly milker, who either has a "walking" case of the disease himself, or has infected his hands in nursing a case.

Bearing these principles in mind, I made a personal inspection of the premises, but found nothing that had not already been discovered by the indefatigable President and his assistants. I will give my observations in the inverse order of their importance.

THE GROUNDS.

Nothing was found that in any way, in my judgment, could have been in the least instrumental in causing typhoid fever.

The dairy, cow-barn, horse-stables and pig-pens were all in good condition. The last named was too far away to have had any effect, even if its condition had been bad.

THE SEWERAGE AND PLUMBING.

When the first dormitory (brick) was built in 1892, a sewer-pipe was laid, with which was connected one water-closet, which was kept locked and used only in case of sickness, the bath-tubs, the waste-pipe from the kitchen sink and five down-spouts from the roof. In 1895 a new system of sewers was put in and the old sewer abandoned, as was supposed, except as a drainage-pipe for the roof water; but it turns out that the plumbers, when making a connection for the sink of the new kitchen, made it with this, thinking it was the new sewer, which was of the same size—eight inches. When taken up (as has been done, the trench being disinfected) this old sewer, while very offensive to the nose from the decaying animal and vegetable matter from the kitchen sink, like the old-fashioned dunghill at the back window of many a country kitchen, was said to have been tight and well scoured. It showed, however, one defect which should be mentioned in this discussion, namely, a small opening at the top, due to a bad joint, in the space under the the butler's pantry adjacent to the butter-room.

The new sewers, as far as examined, were in good condition, except the stoppage of one near the President's house, about one hundred yards below the Teague house, by the roots of a tree—an accident which is said to be practically unavoidable. This had been remedied at the time of my visit.

THE PLUMBING.

While mended plaster and stains on the wall under lavatories, and bath-tubs in some instances, indicated defective work at first, these defects had been remedied, and I should say that the interior plumbing was good. I regret to say that the same cannot be said of all the external plumbing, by which is meant the connections between the house fixtures and the sewer, for one notable exception was found in a leaking soil-pipe connecting ten water-closets on the second floor of the main or brick dormitory with the main sewer. This pipe was not leaking at the time of my visit, for it had been torn out and replaced as soon as the leak was found, but all agree that it was leaking when examined—on the 18th, if I mistake not—and that the adjacent soil was wet. This pipe was 17 feet long. The first five feet from the down pipe being of iron, and the remaining 12 of 6 joints of terra-cotta, which latter section, beginning not quite a foot under the surface of the ground, rapidly descended to the main sewer at a depth of 4 feet. It ran under the butler's pantry or serving-room of the dining-room, the floor of which is about 2½ feet above the ground, parallel to and 18 inches distant from one wall of a closet under the steps leading from the dining-room to the dormitory above. In this closet, for the lack of any other approximately cool place, the butter was kept—only, however, for a few days at most, after being received from the dairies before being consumed. The cakes of butter, with very rare exceptions, were wrapped in impervious parchment or paraffin paper. In the wall of the butter-closet, adjacent to the soil-pipe, an opening 20 by 42 inches, the bottom being on the floor, which was practically on a level with the ground, had been cut for ventilation. Opposite this opening and in a line across the leaking soil-pipe and the saturated earth, and about 20 feet distant, was the only opening in the foundation wall of that section of the building.

In this discussion of the sewerage, I wish to acknowledge my indebtedness to Colonel A. W. Shaffer, the Sanitary Engineer of the Board of Health, and to Mr. J. L. Ludlow, C. E., of Winston, an ex-engineer of the Board, and now so well and favorably known in that capacity throughout our

State and other Southern States, who was employed by the College to make an inspection.

FLIES.

Flies convey the germs by walking over the bowel discharges of a typhoid fever case and carrying them on their feet to food in the kitchen or dining-room. I made careful inquiry as to the occurrence of typhoid in the neighborhood of the College. I could learn only of one case, in the person of the night-watchman, who was sick in August. I sent for and questioned him as to the disposal of his dejections, and was informed that they were invariably placed in a hole dug in his garden, disinfected and covered up with earth. Flies did not frequent sewage-wet earth, around the leaking soil-pipe, because it was too dark for them. The fly must be excluded in this instance as a cause. In passing, I should say that there was no possibility of the contamination of the drinking water by this patient.

THE MILK.

There was no reason to suspect the milk, all of which was obtained from the College dairy, and the fact that only fourteen of thirty-eight patients drank milk when well, and the further fact that not a single case of sickness occurred in four families who bought milk from the College negatives this possible and not infrequently probable source of infection.

THE DRINKING WATER.

The water supply was obtained from the city water-works and three wells, one at the Teague house, across the street from the College, rented for a dormitory, located within ten feet of the house sewer; one at the wooden dormitory, within twenty feet of one of the main sewers; and one in the open space between the Administration building, the brick dormitory and the dining-room, about 125 feet from the leaking soil-pipe and fully as far from the sewer of the main building. This well is about 40 feet in depth, 15 feet being in earth and the rest in what appeared to be solid rock. Samples from all four of these sources were sent to the State Chemist for analysis by Dr. McIver as soon as the diagnosis of typhoid fever was made, and the analyses were made on the 19th of November. The Chemist pronounced those from the three wells, from the chemical point of view, good drinking water, and that from the city supply bad, owing to the high percentage of albuminoid ammonia, though he stated that it might be due to vegetable contamination—as was doubtless the case, from fallen leaves in the stream furnishing the city water. As soon as I learned that the disease was typhoid fever, I wrote President McIver, suggesting that he write Dr. Anderson at Wilson, the bacteriologist of the Board for the section of the State including Greensboro, for sterilized bottles and have a bacteriological examination of the waters made, as it was much more important than a chemical.

He did so; the bottles came; the samples were taken, packed and carried in person by Professor Joyner to the express office and receipt taken on Friday, November 24th. On Monday morning Dr. McIver telegraphed Dr. Anderson for the result of the examination for the meeting of the Board of Directors that night. He replied that the water had not been received. Inquiries showed that the box had never left the express office at Greensboro. I mention this to explain the delay at which the people were growing impatient, and would add that bacteriological examinations require several days. Other bottles were immediately sterilized, new samples taken and gotten off that night, the express company exerting themselves to hurry them forward.

Dr. Anderson's report has been received. It shows the water of the Teague well and of the central well near the brick dormitory to be infected with intestinal bacilli, and that of the other well and city supply to be free from harmful germs.

EXPLANATION.

The general impression, with a reservation as to the bacteriological examination, was that the leaking soil-pipe was the cause of the fever, on the theory that every time the door of the butter-room was opened a draft of air from the outside blew over the sewage-saturated earth through the ventilator opening in the wall, carrying with it the germs and infecting the butter—and possibly other food products in the general store-room, the door of which is ten feet from that of the butter-room and opens on a connecting passage. This condition was unsanitary in the highest degree, and sewer gas in sleeping and living rooms is undoubtedly a cause of disease, but, being extremely skeptical, to say the least, as to the aerial transmission of typhoid fever, I could not accept this theory, though I feared I would be compelled to do so. The cause, whatever it was, was one common to all the residents in the College, either food or drink, partaken of by all, as the sickness was impartially scattered through the three widely separated dormitories. The central well was the only one used by all. Its location, one hundred and twenty-five feet from the nearest sewer, slightly up-hill, and twenty-five or more feet through solid rock, made its infection seem very improbable. But "solid" rock generally has cracks in it, and from somewhere, most probably, of course, the leaking soil-pipe, which may have been leaking for several years—it was put in in 1895—the sewage traveling very slowly, perhaps, and just reaching the well this fall, bacteria, found only in the intestine of man or animal, have gotten into that well. The surroundings exclude animal origin. The specific germ of typhoid fever is close akin to—some say identical with—the ordinary intestinal or colon bacillus, its habitat and habits being much the same; and drinking water contaminated with human sewage, although the bacillus typhosus may not be isolated, which is a difficult thing to do, is regarded as a sufficient cause for the disease. The objection that the outside students drank of this same water, I would meet by saying that they were in the institution only five or six hours a day, five days in the week; that women proverbially drink very little water—too little for their own good, generally—and that small doses of the poison do not cause the disease always. Then some are more susceptible than others—hardly more than ten per cent. succumbed to full doses.

CARE OF THE SICK.

I went through the Infirmary and saw the arrangement and management, and I do not hesitate to say that with skilful physicians, trained nurses, good surroundings and an affectionate interest on the part of every one connected with the College, the sick could not be cared for better anywhere.

THE MANAGEMENT.

In the light of what has occurred, it is easy to say that those in control of the institution are to blame. I think not, any more than we all are, under similar circumstances. As I understand it, the plumbing was let to responsible parties, the contract being for a "first-class" job, and there seems to have been no reason to suspect the leak, for a particular inquiry of the young lady who was in the butter-room every day developed that she had not noticed any odor other than that usually found in all basements. None of us have our wells examined bacteriologically unless there is reason to suspect them. Situated as it is, the contamination of the central well appeared hardly possible. If the management were deserving of criticism in the least it would surely come from the friends of the sick. With a remarkable unanimity they commend it in every respect.

I was particularly requested by the Board of Directors to state in this communication that they had by formal resolution expressed their approval of the action of the Executive Committee and their appreciation of the conduct and work during this trying ordeal of President McIver and the members of the faculty, and their entire confidence in him and them. I was also asked to say that the report of the physicians to the Board was eminently satisfactory. For myself I wish to say that I was more thoroughly convinced than ever of President McIver's eminent fitness for his position, and that I shared the confidence of the Board in the medical attendants.

CONCLUSION.

The old sewer has been entirely removed, the leaking terra-cotta soil-pipe has been replaced with iron, laid in lead-joints, the contaminated earth will all be removed, and the space disinfected and refilled; the wells will all be filled up, and the city water will be safely used, probably sterilized to insure its keeping safe, and every nook and corner of the buildings used by the students will be thoroughly disinfected with bichloride of mercury and formaldehyde gas. In short, everything that science and common sense may suggest will be done, and, in my opinion, residents in the State Normal and Industrial College will hereafter be safer than ever before, and no old student need hesitate to return nor new one to enter for fear of typhoid fever. There is no reason why the great usefulness of this noble institution should be impaired.

MORAL ON BEHALF OF THE BOARD OF HEALTH.

Every city and town should have an expert inspector of plumbing, and require inspection by him of every job before it is covered up and accepted, and all public institutions and private boarding-schools and other establishments with plumbing should require a similar inspection. Wells near sewers, or any accumulation of filth, especially of human origin, are dangerous. Guard with jealous care the purity of your drinking water.

SUPPLEMENTARY REPORT.

In order to ascertain if any sewage bacteria had been wafted into the butter-closet from the air above the leaking sewer, sterilized swabs of cotton, after the manner of collecting the bacilli of diphtheria, having been dipped in boiled water, were wiped on the shelf behind the fruit jars in the said closet, on a ledge in the wainscoting near the ventilator opening, on the floor on the side opposite this opening, and in a small, dusty corner near the door, and in sterilized test-tubes were sent to Dr. Anderson and to Dr. A. C. Abbott, the distinguished bacteriologist of Philadelphia. Both reported no sewage bacteria found—as we expected.

Samples from the three wells, a cake of butter from one of the boxes, and a sample of milk were also sent to Dr. Abbott. He reported: for the Teague well, "suspicious organisms"; for the well at the wooden dormitory, "no suspicious organisms were found"; for the central well near the brick dormitory, "organisms belonging to the group of intestinal bacteria were found in this water." It will be noted that both the bacteriologists agreed in finding the Teague and the central wells infected, and the well at the wooden dormitory free from suspicious organisms. Colon bacilli were found in both the milk and butter, but we doubt if any milk from the neatest of ordinary dairies can be found uninfected with the colon bacillus of the cow, which is undistinguishable from that of the human being. But for reasons given in the report above, we are satisfied that the cause of the fever was not in the milk, and no butter is made at the College during the session. It is possible, however, it shoud be said, that some of the butter might have been infected at one of the various dairies from which it was obtained by infected water used in washing it. There is no evidence of this to date. The specific bacillus typhosus was not found by either bacteriologist in any specimen, which, however, does not prove by any means that it was not present in the water. We learn from one of the highest authorities on the subject, of very large experience in examinations of drinking water, that he has never succeeded in isolating that bacterium in water.

The "weak spot" in our theory that the infected water of the central well was the cause of the typhoid fever was, we then supposed to be the fact, that the outside students, none of whom were sick, also drank of this water from the coolers in the main building. Subsequent inquiry, however, has developed the fact that such was not the case. During the vacation the two or three officials remaining at work in their offices in the main building, thinking it best not to use water from a well not used by any one else, ordered the janitor to get their drinking water elsewhere, and he thenceforth obtained it from the "mineral spring" and the well at the wooden dormitory, which was in daily use, and which, it will be remembered, was not infected. After the opening of the session he continued, without being told, to get the drinking water for the main building, it turns out, from the same pure sources, although the central well had been cleaned out. So the outside students did not drink of the water of the central well. This practically settles the question, to our mind, as to the origin of the disease. Upon making special inquiry, we learned that at the very beginning of the sessions of 1896 and 1895, there were respectively in the brick dormitory, whose water-closets emptied into the leaking sewer, one and two cases of typhoid fever, so that if the leaking sewer was the source of contamination, as is most probable, there being no other possible source yet discovered, and if the typhoid bacilli could live so long in the sewer, the *specific* infection at the central well is clear.

In regard to the nature of the fever or fevers, the opinion has been expressed to us by three physicians whose opinions have weight with us, that all the cases were due to the typhoid poison. We appreciate the force of their reasoning, although we are by no means convinced. But as the physicians in attendance upon the sick will shortly make a full report, we postpone discussion of this question further until that is published. It is a very interesting question.

AGRICULTURAL AND MECHANICAL COLLEGE FOR WHITES, AT RALEIGH.

DR. GEORGE G. THOMAS,
President North Carolina State Board of Health.

DEAR SIR:—We have inspected, as ordered, the Agricultural and Mechanical College at Raleigh, and respectfully report:

Our inspection of this institution showed it to be generally in good condition, but we think the sanitation of the premises would be improved by:

The substitution of water-closets for the surface privy in rear of boiler-house;

The moving of the long privy further down the hill, as recommended in a former report;

The disinfection and filling up of the old abandoned cess-pool near the barn;

The exclusion of animals from the bottom below the barn in which the bored wells furnishing the water supply are situated;

The filling up of the well in front of the boiler-house, should a second bacteriological examination show the continued presence of intestinal bacilli already found therein, and use of water from the bored wells only. Should further investigation, however, demonstrate the purity of this water, and it be desirable to resume its use, we would recommend that the chain and bucket be discarded, as the well could be easily infected by the soiled hands of any one drawing water, and that the top of the well be covered and a pump installed.

Richard H. Lewis, M. D.,
A. W. Shaffer, S. E.,
Committee.

AGRICULTURAL AND MECHANICAL COLLEGE FOR THE COLORED RACE, AT GREENSBORO.

Dr. George G. Thomas,
President North Carolina Board of Health.

Dear Sir:—Having concluded our inspection of the Normal on Tuesday morning, we repaired to the A. and M. College for the Colored Race, situated in the northeast quarter of Greensboro. We found clean grounds; rather imposing brick buildings with low ceilings and cracked walls; a well of hard water and city connection; the mouth of the sewer in a very small stream barely two hundred feet from the campus; an excellent diagram of the grounds, buildings and underground drainage made by the Engineering class; about —— students in a complacent state of uninterrupted health, and a resident physician bewailing the noxious desuetude of a doctor without a patient.

The dormitory is full, but not overflowing, as at the Normal, but it is up to its normal capacity, and a slight increase of non-resident students will produce crowding.

We are of the opinion that the mouth of the sewer is too near the building; but it is within about thirty feet of the north line of the property, beyond which it cannot be extended without the consent of the adjacent owner. The little branch, after crossing the line, is overgrown with grass, weeds, briers, shrubs and trees, through which the sewage is filtered, leaving the residue suspended along the banks and the odors floating in the air. This north boundary line and sewer should be extended at least five hundred feet northward down the stream and the stream should be straightened, deepened and the banks cleared up, as above the mouth of the sewer.

All of which is respectfully submitted.

HENRY H. DODSON, M. D.,
A. W. SHAFFER, S. E.
Committee.

November 24, 1899.

SCHOOLS FOR THE DEAF AND DUMB AND THE BLIND AT RALEIGH.

DR. GEORGE G. THOMAS,
President North Carolina Board of Health.

DEAR SIR:—According to instructions, we have made inspections of the Schools for the Deaf and Dumb and the Blind at Raleigh, and respectfully beg leave to report as follows:

SCHOOL FOR THE WHITE BLIND.

We were very favorably impressed with the cleanliness and neatness of the corridors and dormitories, particularly in view of the character of the inmates—afflicted children. We found, however, several matters demanding attention, as set forth below.

GIRLS' BUILDING.

The lavatories, consisting of wash basins, bath-tubs and water-closets on the second floor of both the north and south wings, were not in use, and the soil-pipe of the teachers' closet on second floor was choked. The corresponding conveniences on the third floor seemed, so far as the plumbing is concerned, to be in good condition. Upon inquiry, we learned that the plumbing on the second floor was old and that the closets leaked when the water was turned on. The work on the third floor was new and up-to-date, that story having been added recently. The choking of the soil-pipe of the teachers' closet had just occurred. While we noted a lack of facilities for ventilating all these apartments, we beg to call particular attention to the water-closets on the third floor. The closets themselves are excellent, but both the battery of seats for the pupils and the single one for the teachers are located in small rooms with no opening whatever for ventilation or light except the door of entrance. The servants' closets for both male and female on the ground floor are of the same character as to light and ventilation—or the want of them. In no part of an inhabited house is the demand for both fresh air and light—the natural enemies of disease germs—so urgent as in these particular quarters.

In discussing the plumbing with Principal Ray, we were told of certain conditions which in our judgment are a serious menace to the health of the institution. The facts of the case are as follows: When sanitary conveniences were first installed there was no general city sewerage system, so that the school had to provide its own private sewer. The soil-pipes from the water-closets in the two wings descended on the rear side of the building, and the sewers receiving them were united at a man-hole in front of the building, and the first part of their course therefore was across and under the floor of the basement, in which are situated the dining-room, store-room, etc. When the city sewerage system was put in the connections were transferred to that and the old sewer was abandoned as a sewer, but continued as a drainage pipe into which the down spouts from the roof emptied. The sections of sewer-pipe, running under the basement were cut across flush with the inner surface of the walls and removed and the open ends in the walls plugged with cement. After this was done, according to the testimony of one of the employees, on the occasion of a heavy rain, the water could not be carried off fast enough, and the back-water forced out the cement plugs and flooded the basement, the dining-room being "knee-deep" in water of the foulest description.

This building being an old one, was constructed without any view whatever apparently to ventilation. It is heated by direct steam radiation, and there is no arrangement for the proper change of the air. The best sanitary authorities hold that a child should have 2,500 cubic feet of fresh air per hour, so that if only 600 cubic feet is allowed to each child, the air should be completely changed four times in that period. As arranged, the fresh air that can get into the building must sneak in through the cracks and the outside doors when opened. In most of the rooms on the old second floor there are open fire-places, and in each room on the old third floor there is a ventilating flue, but they cannot perform their function of taking out the foul air unless a sufficient volume of fresh air is admitted to make a current and insure circulation. It is true that the ventilation can be improved by opening the windows, but in cold weather the draught therefrom is sometimes dangerous, and it is practically impossible to keep them open or properly regulate them.

We regard this want of ventilation as a very serious matter, the more so because its effects are experienced by not only growing children but afflicted children. The vital processes of the animal economy may be fitly compared to the steam-generating boiler. The stronger the draught, the more oxygen supplied in other words, the hotter the fire and the more rapid the development of steam or power. In the animal the food represents the fuel, the respiration the draught, and vital force the steam; therefore, the better the food the deeper and more frequent the respirations, the greater the vital force. In growing children, as there must be a surplus balance—something beyond merely holding one's own—these changes are more active than in the mature. They eat more than adults in proportion to weight, and by their incessant activity they keep on a large part of the time what might be called a forced draught, and as a consequence the vital fires burn bright. But blind children are debarred by their infirmity from taking much active exercise, they cannot force the draught, and consequently it is all-important that they should have the purest air in the greatest abundance.

In view of the above, we would respectfully recommend:

1. That the plumbing be thoroughly overhauled and put in first-class order.
2. That all water-closets be both ventilated and lighted.
3. That the old abandoned sewer immediàtely adjacent to the building be removed and the soil disinfected, and that the present inferior wooden floors of the dining and store-rooms be replaced with cement of good quality, properly laid.
4. That the general ventilation of the whole building be improved. We beliëve that this can be done at comparatively small cost by substituting direct-indirect radiators connecting with the outer air for the present direct radiators, the opening of all transoms over inside doors and the provision of an outlet flue in every room of sufficient size.

BOYS' BUILDING.

We were much pleased with this handsome new building as to construction, arrangement, lighting, heating and ventilation. The system employed for the two last named, what is known as the fan or propulsion system, in which fresh air from outside is driven by a fan through a steam coil, and thence, having been warmed, through conductors to every room, the foul air being forced out through ventilating flues opening near the floor, is, in our opinion, the very best yet devised. The only thing we found to criticise was a decided fecal odor in the water-closet on the second floor, the cause of which should be ascertained and removed.

The new water supply from the deep-bored well ought theoretically to be perfectly safe. We learn, however, from the analysis of the State Chemist that the proportion of organic matter is too high. Its origin is obscure. If it comes from the surface it may be dangerous. While the immediately surrounding soil is too low, and it is a fact that deep wells can be polluted by drainage trickling down the outside of the pipe, we do not believe that the water has been contaminated from that source. We would, however, advise that as soon as the brick house now in process of construction around it is finished, earth be banked against the walls to a sufficient height to give surface drainage away from it in every direction. We would also recommend that the brick floor of the laundry, about 20 feet distant from the well, the cemented surface of which is cracked and worn off in places, be re-cemented to prevent seepage through it of the slops.

SCHOOL FOR THE DEAF AND DUMB AND THE BLIND—COLORED.

GIRLS' BUILDING.

As in the case of the school for the white blind, we found the general conditions as to cleanliness and neatness of corridors and dormitories good.

The plumbing, with the exception of the sink on the ground floor, we found sufficient and in good order, but the heating and ventilation could, we think, be much improved. The heating is done by direct steam radiators in the corridors, and there is no arrangement for taking out the foul air, the numerous open fire-places scattered through the building, which would answer admirably for this purpose, having in several instances been closed up entirely and in others nearly so, a very small and inadequate opening being left.

Two cases of typhoid fever have occurred in this building during the current session. The regular water supply is from the city mains, but the children have access to wells in the vicinity.

We were informed that a condition very similar to that obtaining at the white institution, in the matter of abandoned sewers running under the house, exists here also.

We would recommend:

That the old sewers be removed and their channels disinfected before refilling;

That all fire-places be opened to their full extent at once;

That direct-indirect radiators connecting with the outer air be substituted for the direct now in use, as soon as practicable, but that such a radiator be immediately installed in the sick-room;

That the water supply, including wells in the vicinity, be analyzed chemically and bacteriologically.

BOYS' BUILDING.

This is a new building, well planned, but not so well built apparently, as large cracks show in the walls at the southern end, suggesting a bad foundation there.

The lavatory facilities are excellent and in good order.

Each room is provided with a transom over the door and a ventilating shaft, but as the building is heated by direct radiation, the circulation of air must be feeble and insufficient.

We would recommend the adoption, as soon as practicable, of the direct-indirect system of heating and the entire removal of all transom sashes so that they cannot be closed.

We were extended every courtesy and facility at both institutions, and the general impression left upon our minds was that they were well managed.

A. W. Shaffer, S. E.,
Richard H. Lewis, M. D.,
Committee.

SCHOOL FOR THE DEAF AND DUMB, AT MORGANTON.

The Honorable Board of Directors,
State School for the Deaf and Dumb, Morganton, N. C.

Gentlemen:—In compliance with section 2 of an Act in Relation to the Board of Health, we have made an inspection of your institution.

We are pleased to report that with the exception of one of the water-closets in the basement, the surroundings of which were more unsightly than positively unsanitary, we found nothing deserving of criticism from the hygienic point of view.

We were impressed with the possible horrors that might ensue upon a fire in the main building, which includes the dormitories, and we would most earnestly advise the provision at the earliest possible time of adequate fire-escapes.

We beg to acknowledge the courteous treatment received from the officials, and to congratulate you and the State on the erection of the beautiful new Administration building.

Respectfully yours,
George Gillett Thomas, M. D.,
Richard H. Lewis, M. D.,
Committee.

THE PENITENTIARY.

Dr. George G. Thomas,
President North Carolina Board of Health.

Dear Sir:—In obedience to instructions, the undersigned have made an inspection of the Penitentiary, and respectfully beg leave to report:

Conducted by Warden Green, we made an inspection of all departments of the State's Prison, and are glad to report the sanitary conditions in general to be very good. We should say, however, that the rear part of the enclosure, while showing nothing really dangerous to health, did not present the neat and orderly appearance to be expected in such an institution, being more or less littered up in various ways.

The cells we found to be well kept and supplied with everything needful, including metal buckets for night-soil instead of the absorbent wooden ones at one time in use. The air space is ample and the ventilation good, there being a ventilating shaft from every cell. The large chamber, in the centre of which the cells are placed, is heated by steam. We regret that we cannot bestow equal commendation on the heating and ventilation of the hospital. The present arrangement, which consists of a cast-iron hard coal stove in each ward for heating, and for ventilation outlet flues, but no inlets except windows, is bad. In summer windows would answer every purpose, but in cold weather they are almost sure to be kept closed. The ventilating arrangement should always be automatic, and as there is already a steam-heating plant in use in most parts of the prison, the solution of the problem under discussion is simple and relatively, when we take into consideration the coal necessary for the stoves, inexpensive. We would recommend the extension of the steam-pipes and the installation in the hospital wards of direct-indirect radiators with the necessary air-ducts connected with the open air. By this means pure fresh warm air would be poured in through the radiators, and the foul air would be forced out the vents already provided. Of all people, the sick require the purest air and the most of it. Their vital fires, so to speak, are burning low, and an abundance of fuel—oxygen—is required. Simple humanity demands that it be supplied, and we hope that the management will see that it is promptly done. The very low death rate during the past year—only three from disease (tuberculosis 2, meningitis 1) in an average population of 300—is not a sufficient reason for letting the present arrangement stand, because there is no telling when the wards may be crowded, when the deleterious effects would be shown.

In this connection we cordially endorse the recommendation by the attending physician, Dr. Tucker, that a separate ward be set apart for tuberculous patients. The infectious character of tuberculosis is now thoroughly established, and the lives of patients sick from other diseases should not be endangered by compulsory intimate association with them.

The water supply for drinking—a large well on the grounds, and not exposed to contamination—is excellent, and for general purposes a reservoir of spring water in the old rock quarry abundant. As a practical proof of the first statement there was only one case of typhoid fever during the year, and that was clearly imported, as the woman was attacked within two weeks of her admission. She recovered.

The sewage is emptied just outside the western wall into an open cemented trough of very rapid fall, which carries it to Rocky Branch. This is an excellent arrangement so far as the prison is concerned.

The convicts generally seemed to be well nourished and in good physical condition.

RICHARD H. LEWIS, M. D.,
A. W. SHAFFER, S. E.,
Committee.

STATE CONVICT FARM.

RALEIGH, N. C., December 29, 1900.

DR. GEORGE G. THOMAS,
President State Board of Health.

DOCTOR:—In obedience to your direction, I visited the State Farms in Halifax county, N. C., known as Caledonia, Nos. 1, 2 and 3, to make the biennial inspection required by law, with Dr. Henry W. Lewis, of Jackson, N. C. I reached the farms on the night of December 27th, made the inspection December 28th, and reached home December 29th. Dr. Lewis came down to the river on the morning of the 28th and found the ferry-boat lodged in the mud away from the bank, where it could not be reached or moved with any available force, and after remaining there until about 3 P. M., returned home, and I made the inspection without his assistance, but cordially supported by Messrs. C. J. Rhem, in charge of Camp No. 2, J. H. McIver, in charge of Camp No. 1, and the second in command of Camp No. 3, in charge of C. N. Christian, who was absent. And of said inspection I have the honor to report as follows:

No. 2, Captain C. J. Rhem, ninety-two convicts, confined within a stockade at night, covering an area of about four acres. The sleeping dormitories, 30 x 75 feet, 12 feet pitch, ceiled overhead and roofed with tin. In each of these dormitories were sixty double bunks, in barrack form, heated with two stoves, lighted by twelve windows, ventilated through centre of ceiling and apex of roof, only one dormitory in use. Dining-room, 30 x 90 feet, 12 feet pitch. Seats and narrow plank tables to full capacity of convicts, and two small plain closets. Light and ventilation as in dormitories.

Hospital, 30 x 42, lighted and ventilated as dormitories, one drug-room inclosed, one dispensing closet. Eight beds, wooden frame and slats, mattresses made on the grounds. Patients, two, one suffering from malaria, the other from a cut. Four have died during the past two years, two in 1899 and two in 1900.

The laundry is 10 x 15 feet. The cook-room, 17 x 35 feet, contains a large iron boiler, oven and stove, in and on which the food of the convicts and patients in hospital is prepared. The building is rough and the oven needs repairs. I have seen cleaner places, but the food was of good quality and seemed to be well prepared. The quartermaster and commissary occupy the same room, 24 x 30 feet, adjoining the kitchen.

The wash-room and bath-room are consolidated, 24 x 30 feet. Three large iron kettles are used to heat water for both purposes; a dozen tubs or half barrels are used for bathing on Sundays, in which all are required to participate, and new convicts immediately upon their arrival upon the grounds.

The dairy, very crude, is 10 x 12 feet. The smoke-house is 14 x 20 feet, and the work-shop 14 x 34 feet.

Water is supplied from four deep wells in and about the premises, raised by hand-lift pumps, of which the water (superficially) is good. Ice-houses they have; but no ice last year, and little prospect for the coming year, save that which is obtained from a distance for hospital and official use.

The closets throughout the buildings are plain, iron hopper pattern, rinsed out and limed after use, and they empty into wooden tubs upon the ground beneath, which are emptied every morning. The rooms of the overseers and guards, one to each class, are small, ceiled and have fire-places, but the furniture is certainly not creditable. They sleep on wooden frame bunks and slats of the most ancient and primitive character, where vermin, once established, can never be eradicated without persistent labor and attention which ought not to be expected of men who have spent the day in no easy duty upon the field.

No. 1, Captain J. H. McIver, has one hundred convicts, and is almost identical in detail with No. 2. The hospital has a better building, and I found it cleaner and somewhat better kept. There was but one patient, suffering from malaria, and none had died during the two years last past. This one building alone was furnished with iron beds and spring mattresses. The wash and bath-room had no floor, only a narrow plank platform on which the convicts took their Sunday baths.

No. 3, Captain C. N. Christian, has 95 convicts. The buildings are less in number, smaller, and not in so good condition as Nos. 1 and 2. The hospital had one patient, suffering from some affection of the heart. None had been lost during the present year, and in the absence of Captain Christian, I was unable to ascertain the mortality of last year.

The quarters of overseers and guards were smaller and in worse condition, from overcrowding and dilapidation, than Nos. 1 and 2. Otherwise there was little to be said of a comparative nature between them. I was informed that No. 3 is operated under a lease which has but one more year to run, and that its renewal is not contemplated; that the Northampton farm across the river is now undergoing surrender and abandonment, and Nos. 1 and 2 have been purchased, and are now the property of the State. These facts seem to make further remarks respecting No. 3 and the Northampton farm unnecessary, while the permanent character of Nos. 1 and 2 command the best counsel of wisdom and experience for their prosperity and success.

Speaking only from the stand-point of sanitation, I would respectfully suggest the following improvement on Nos. 1 and 2, in the order of their importance:

1st. That a wind-mill be erected at each of these two camps, with tank of suitable dimensions to hold, say a week's supply of water, together with the necessary water supply pipes, plumbing and sewerage. As all the buildings are one story, the tank could be built of brick, raising the floor ten (10) feet above the ground, and the brick could be made on the farm.

2d. Change all beds in Hospital No. 2, and overseer and guard-rooms of both camps from wooden bunks and slats to iron frame and spring mattresses.

3d. Plant a grove—8 to 10 acres—of forest trees at each camp to modify the intense heat of the summer sun. The trees adapted to that locality are numerous, and among them are the sugar and Norway maples, the white, the water and the willow oak, the persimmon and black walnut, and best and choicest of all, the great Columbian pecan, whose nuts command the highest price of any nuts known to commerce. The trees should be set from 30 to 50 feet apart, according to their habits, requiring from 16 to 49 trees to the acre. All except the pecan can be obtained from the nurseries of the country at twenty-five to fifty cents each, and the grafted pecan of the specific variety named from the nurseries of the Gulf States at $1.50 each, in quantity.

All of which is respectfully submitted.

A. W. SHAFFER,
Sanitary Engineer State Board of Health.

WILMINGTON, N. C., December 27, 1900.

BOARD OF DIRECTORS STATE PENITENTIARY.

GENTLEMEN:—In accordance with the instructions of the Board of Health, I visited the State farm near Wadesboro, and beg leave to report that it had a satisfactory air of cleanliness, and as much comfort as the buildings could afford.

The barracks were amply sufficient in air space for the number of convicts, amounting at my visit to thirty-five, and would provide for the safe accommodation of double that number. The latrine in the end of the barracks was carefully cleaned, and had been freshly limed for use at night. The air in the building was wholesome and the prisoners were clean. Sewage matter accumulating in the tubs under the corner of the barracks at night and under the closets in the yard during the day is carried each day to a ditch an eighth of a mile from the prison yard and emptied. The ditch carries the matter to a neighboring creek, and is thoroughly cleansed by rains, the fall of the creek providing for its efficient flushing. The food supplies seemed ample, were clean and of good quality.

I found three wells on the premises; one behind the laundry—an old-fashioned one with wooden curbing—from which I was assured that only water for washing was drawn; another in the yard of the enclosure had been dug down through a layer of rock to a depth of forty-six feet and curbed with 24-inch terra cotta-pipe, the space on the outside of the pipe being closely packed with sand and loose stone. This well was dug with the idea of use for the barracks, but the prisoners disliked it, and the

Superintendent had returned to the well in front of the yard, several hundred yards from any source of contamination, yielding an apparently safe supply. This water, I was informed, was used entirely for drinking and cooking.

There had been very little sickness in the station, and none of any serious character, except a case of sun-stroke last summer. The room set aside for the hospital was quite comfortable and very clean. I respectfully submit that the healthfulness of this station is well assured, and the care of the inmates is in good keeping.

I wish to acknowledge the prompt attention of the Superintendent, Mr. Wall, and his Steward, Mr. McMillan, and their courtesy to your reporter during his visit; with this to their credit, that my visit was entirely unexpected, and I found matters as I should suppose they would be every day.

Yours very truly,
George Gillett Thomas, M. D.,
For Board of Health of North Carolina.

His Excellency, D. L. Russell, *Governor of North Carolina.*

Sir:—We, the undersigned, a committee of the State Board of Health, in compliance with your request and acting under section 3 of the Act in Relation to the Board of Health, chapter 214, Laws of 1893, on Wednesday, the 27th inst., made a careful sanitary inspection of the late convict camp at Castle Hayne, and respectfully beg leave to report as follows:

Our observations covered the barracks or quarters of the convicts, the arrangements for disposing of the night-soil, the water supply and the condition of the phosphate mine, and we will take them up in the order given.

The Barracks: The quarters for the convicts are all assembled in one wooden building with walls of one plank in thickness, the cracks being broken with strips, covered with tin and consist of one dormitory or "cell" 30 x 46 x 12 feet, with an open roof having a large latticed ventilator on the comb, a similar but smaller room for use as a hospital for the sick, and between the two a kitchen and dining-room, or mess-hall. In the cell are two rows of double bunks two tiers high, thirty-eight in number, affording sleeping accommodations for seventy-six men. We were informed that for a short while as many as one hundred and twenty-five had been lodged therein by means of another row of bunks down the centre of the room.

The chimney of the bake-oven of terra-cotta pipe we found very badly cracked.

The sanitary arrangement for use at night consisted of a single stool at one end of the cell, opening through the floor and emptying into a tub placed on the ground beneath. The accommodations were the same in this respect in the hospital.

The Water Supply: Seventy-five feet from the tub under the cell and a less distance from that under the hospital is a well about eighteen feet in depth down to the rock with a square curbing of plank more or less decayed. We were told that a hole had been drilled into the rock six or eight feet, but that it was filled up. We were also informed that at one time for several months water for the prisoners was obtained from another well in a grove two or three hundred yards distant. We did not inspect this well, but accepted without dispute the statement that it was a better well than the one in the yard.

In a room adjacent to the shingle-roofed house occupied by the officials of the camp we found what appeared to be an excellent cistern of about three hundred and fifty barrels capacity, it was said, with the guttering of the house arranged to deliver the roof-water to the filter and thence to the cistern. It was full of water at the time of our visit, and therefore, we assume, free from cracks. Upon inquiry, we learned that it had not been utilized for drinking purposes, owing, it was suggested, to a prejudice against the water caused by finding in it certain unsavory objects, including a dead cat, which lost its life through the carelessness of some one in leaving the top off, and, in all probability, we would add, to a want of appreciation on the part of the local management of the great superiority in that locality of cistern to well water.

The Phosphate Mine: This is a wide pit with walls averaging, we would say, about 25 feet on the high side and 10 on the low side. It is located quite near the bank of the creek which runs by the place, the lowest level at which the phosphate is found being well above the water-level of the creek. Leading from this pit, with ample fall to drain its bottom into the creek, is an open ditch. Although partially filled up since the stoppage of work, there was still not enough water standing to prevent our walking all over the bottom. We found in the mine, mounted on a small flat-car, a steam-pump and boiler, which it had been found necessary to use only once, we were told, to pump the water from a pocket of phosphate below the general level. There is no reason why diggers of phosphate there should work in water.

Recommendations: 1. That the number of occupants of the cell be restricted to a maximum of sixty, a number out of proportion to the size of the room, but owing to the exceptional ventilation admissible. That a box containing dry earth and a shingle be placed by the side of the stool and prisoners required to cover each evacuation with dry earth. That a water-tight tub of not less than 20 gallons capacity be kept under the stool and emptied every day. That the cracked terra-cotta be replaced with a brick flue as a protection against fire.

2. That the well be immediately filled up. That the cistern be thoroughly cleaned and the filter refilled in accordance with the directions given in the health pamphlet on Drinking Water and Malarial Diseases, copy of which accompanies this report. That the water from the tin

roof of the barracks be utilized for the cistern. And to insure an abundance of good water for all purposes under all circumstances, that a bored well be sunk at some suitable point.

3. That the ditch draining the phosphate mine be opened and kept open to a depth sufficient to take off promptly all water therefrom.

Conclusions: Upon looking over the Penitentiary reports we find that the total number of deaths since convicts were first sent to Castle Hayne in 1892 is 25, of which number 8 were assigned to malarial fever, five of those having died in 1898. These were the only deaths that could be rightly attributed to any intrinsic local influence. That some, if not all of them, might have been prevented by proper care, is suggested by the experience of Mr. Sharon, a white man, who went there nine years ago direct from the hill country of Warren county, and who, although peculiarly susceptible to malaria on that account, has not been sick a day. He has drunk cistern water from his home just across the creek.

A small dose of quinine daily is an almost certain preventive of malarial attacks, and we would respectfully suggest its use in all malarial camps during the months of August and September.

With a pure water supply, reasonable attention to the collection and removal of the night-soil and proper care of the prisoners in a general way, we see no reason why work in the wide, shallow phosphate pit, lying open to the sun and air, should not be as free from danger as any other kind of labor in the eastern section of the State.

Respectfully yours,
George Gillett Thomas, M. D.,
Richard H. Lewis, M. D.,
Committee.

December 29, 1899.

SOLDIERS' HOME.

Dr. George C. Thomas,
President State Board of Health.

Dear Sir:—In obedience to instructions, we have made an inspection of the Soldiers' Home, and respectfully beg leave to report:

The buildings at this institution are of wood and rather rough in appearance, but seem very well adapted to the purpose for which they are used. The dormitories, consisting for the most part of rooms large enough for two, are supplied with open fire-places for wood, and while very plainly furnished, are suggestive of comfort.

The old hospital building deserved to be replaced by the new one, which, while finished, is not yet occupied for lack of certain delayed furnishings. We were very much pleased with this building, for although not heated and ventilated according to the modern hospital ideal—a very expensive ideal, unfortunately—each ward has an open fire-place as well as a separate flue for stove, and there will be no practical trouble on that score. The internal arrangement is rather unique and decidedly pleasing, the large triangular "sun-parlor" being a feature. Each of the four wards is supplied with white enameled brass-tipped iron bedsteads, with good mattresses on woven wire springs, and has its own complete sanitary conveniences of excellent pattern, the water supply being pumped from a well in the grounds by a gasoline engine. In this connection we would suggest that as a water supply and sewerage has been provided for the hospital, it would be well to supersede the present surface privy for general use with modern water-closets, for although the former is well kept it is out of date.

The kitchen and dining-room were very neat and clean, and would put to the blush those of many pretentious private establishments.

The stables, pig-pens and grounds generally were all in good order, and the impression we brought away was, that with the facilities at hand, a great deal was accomplished in a very excellent manner.

A. W. SHAFFER, S. E.,
RICHARD H. LEWIS, M. D.,
Committee.

OXFORD ORPHAN ASYLUM.

RALEIGH, N. C., October 25, 1900.

DR. GEORGE G. THOMAS,
President, etc.

DEAR SIR:—I passed through Oxford, on my tour of inspection and sampling of municipal waters, September 20th, and took that opportunity to make a general inspection of the Orphan Asylum at that place, which had been ordered by the Board of Health, and I think it proper to make a separate report thereon, as follows:

Reaching the Asylum early in the morning, I found Miss Nettie Beamis, Lady Principal, in charge, Colonel Hicks, the Superintendent, being absent in town. He came in a few moments thereafter, and with these two and plenty of time on my hands, we visited the study and recitation-rooms, the chapel, sleeping-rooms and closets, printing-office and paper store-rooms, some of the outside dormitories, the hospital, garden, farm and campus, pumping station and water-tank, and about 210 pupils—in fact, about everything on the grounds, except the mechanical department, which is located out on the borders of the town, like a pest-house, and train time was at hand when I was ready to visit it.

Critically speaking, I found the official residence of the Superintendent away down the hill, nearly out of sight and entirely beyond hearing of the campus and in the vicinity of the hospital, where neither ought to be; the printing-office and paper store-room in the Administration building, where they ought not to be; the water-tank leaking badly, in the teeth of a water famine, and the ground beneath the great oaks of the campus swept and garnished, while the trees were famishing for leaf-mulch, moisture and food.

Truthfully and justly speaking, I found the buildings and grounds absolutely free from that bane of public institutions—visible vermin and filth; the neatest dressed, cleanest and most orderly children and the best kept and cleanest rooms, furniture, beds, clothing, food, kitchen, closets, store-rooms, grounds and buildings which I have encountered, officially or otherwise, in a public institution of this character anywhere.

I did not tarry to determine whose was the master-hand, or whether two were joined in the "Master's Grip," to so conduct and manage this loving duty to the memory of those who fell in "battle's magnificently stern array," but I did learn that it is an institution of which the noble Order that originated and maintains it, the people of the State who, through their Legislature, contribute to it, and the children and friends of the children who are its beneficiaries, may well be proud.

I am very respectfully,

A. W. SHAFFER,
Sanitary Engineer.

MUNICIPAL WATER SUPPLIES.

Since our last report there has been a gratifying advance on this line of sanitary improvement, no less than eight towns having installed water-works in that time—a gain of fifty per cent. It shows that our people are becoming more and more alive to the importance of pure water in abundance.

The proposed Act to Protect Water Supplies, which was printed in the last report, was enacted by the General Assembly of 1899, although in a somewhat emasculated form. Taken, however, together with the sections in the Act in Relation to the Board of Health bearing on the subject, legislation is perhaps sufficient to enable municipalities to protect their supplies if they desire to do so. It is to be regretted, however, that with two or three honorable exceptions the municipal authorities have not so far shown any special disposition to avail themselves of the powers conferred upon them by the law to this end. But the vast majority of our people obtain their drinking water from wells and springs and cannot therefore be benefited by this legislation. Until quite recently they have been entirely unprotected, owing to the insufficiency of the appropriation made to the Board of Health, but the Board of Agriculture, at its meeting in December, 1900, made provision for the bacteriological examination of such waters when suspected of causing disease, and it is confidently believed that much sickness and many deaths from typhoid fever will be saved by this enlightened action on their part. A more detailed statement of this matter will be found in the appended extract from the monthly BULLETIN, entitled "Another Advance in Sanitation in North Carolina."

The regular biennial inspection of the public water supplies of the State was made by the Engineer of the Board, and the following is his report:

REPORT OF COLONEL A. W. SHAFFER, ENGINEER OF THE BOARD.

RALEIGH, N. C., December 1, 1900.

DR. GEORGE G. THOMAS,
President State Board of Health.

SIR:—I have the honor to submit herewith my report of my second biennial tour of inspection and sampling of municipal waters of the State, made in conformity with law, under direction of the Board.

I visited the following cities in the order named, to-wit: Raleigh, Durham, Oxford, Henderson, Tarboro, Rocky Mount, Wilson, Goldsboro, Greensboro, Reidsville, Winston-Salem, Asheville, Statesville, Salisbury, Concord, Gastonia, Charlotte, Monroe, Sanford, New Bern, Wilmington, Fayetteville, Lumberton, total 24. Of these, Tarboro, Rocky Mount, Reidsville, Statesville, Gastonia, Monroe, Sanford and Lumberton have been established since last report, and Oxford was visited only for the inspection of the Orphan Asylum, of which you have separate report. I speak of those works which were in existence two years ago, and were fully reported upon, only with respect to the changes, modifications and improvements observed.

LUMBERTON.

Water from eight deep-flowing wells, located about the city, the finest at the old Fair Grounds, about a mile from town, but now abandoned. This magnificent well, flowing 80 to 100 gallons a minute, is allowed to go to waste in the face of the fact that the other wells are slowly diminishing in flow. What a munificence of profligacy and waste! It belongs to the town and has never been analyzed. Samples No. 17, from the large flowing well at the station-house. Odor and taste of sulphur. No sewerage.

Chemical Analysis.

Total solid matter in solution and suspension	8.5	gr. per U. S. gal.
Hardness	6.85	deg. Clarke's sc.
Equivalent to calcium carbonate	5.85	gr. per U. S. gal.
Chlorine	.40	gr. per U. S. gal.
Free ammonia	.0232	parts per mil.
Albuminoid ammonia	.0790	parts per mil.

Bacteriological Analysis by Dr. Pate.

No. of sample, 17; source, Lumberton; date, November 24, 1900; sterile.

Thinking there must have been some mistake somewhere, being extremely skeptical as to sterile natural waters, we ordered another examination. The following is Dr. Pate's report. We congratulate Lumberton:

GIBSON, N. C., January 9, 1901.

DR. R. H. LEWIS,
Raleigh, N. C.

DEAR DOCTOR:—At your request, January 2d, I sterilized a bottle, first by steam then by dry heat, and expressed it to the mayor of Lumberton, with a request that he send me a second sample of water from the same source that Colonel Shaffer collected the first sample. The mayor responded promptly. The water was placed on culture media about five hours after sample was taken. Bouillon, gelatine and milk prepared by myself. Glycerinized agar, lactose, litmus agar and Elsner's prepared at the laboratory of Parke, Davis & Co.

After five days' exposure, glycerinized agar at 41°, the other media at room temperature remains sterile, except three moulds on agar and two colonies of micrococci on gelatine, which I think accidental.

I report a second time the sample of water from this source, viz.: artesian well No. 3, Lumberton, is practically sterile.

Yours very truly, W. T. PATE.

SANFORD.

Deep well water. No sewerage system. Plant in a small brick building. An old pump and engine, chronically indisposed, not more than half the requisite power. An ill-constructed and ill-kept reservoir adjoining. All built primarily for railroad supply. Water samples No. 15, taken from pump in engine-house, has never been analyzed.

Chemical Analysis.

Total solid matter in solution and suspension	14.7	gr. per U. S. gal.
Hardnesss	4.60	deg. Clarke's sc.
Equivalent to calcium carbonate	3.60	gr. per U. S. gal.
Chlorine	1.35	gr. per U. S. gal.
Free ammonia	.8877	parts per mil.
Albuminoid ammonia	.1093	parts per mil.
Nitrogen as nitrates	.756	" " "
Nitrogen as nitrites	1.000	" " "

Bacteriological Analysis by Dr. Pate.

No. of sample, 15; source, Sanford; date, October 10, 1900; number of bacteria per C. C., 600; fermentation test (lactose bouillon, glucose bouillon), ferments; reaction, acid; litamusgar, blue colonies; gelatine, liquifies; motility, slight; litmus milk, coagulated second day, heliotrope; potato, white, moist growth; Elsner's, moulds; indol, slight. Remarks, proteus vulgaris.

MONROE.

Water from a 750-foot well, has an odor and taste of sulphur. No sewerage system. Samples No. 14 from the mouth of the well at the pumping station. Pretty good plant in brick station-house, but pump and engine are too light. This is the brag water of the State; claimed to be charged with lithia and "cures liver, kidney and bladder diseases." Has never been analyzed to date. It belongs to the town.

Chemical Analysis.

Total solid matter in solution and suspension	11.4	gr. per U. S. gal.
Hardness	5.65	deg. Clarke's sc.
Equivalent to calcium carbonate	4.65	gr. per U. S. gal.
Chlorine	1.25	gr. per U. S. gal.
Free ammonia	.0295	parts per mil.
Albuminoid ammonia	.0572	parts per mil.
Nitrogen as nitrates	.095	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Pate.

No. of sample, 14; source, Monroe; date, October 9, 1900; number of bacteria per C. C., 40; fermentation test (lactose bouillon), does not ferment, (glucose bouillon), does not ferment; reaction, acid; litmus agar, blue colonies; gelatine, does not liquify; motility, active; litmus milk, coagulated sixth day; potato, white, moist, elevated; Elsner's, no growth; indol, none. Remarks, water good.

GASTONIA.

A new water and sewerage system, very full, but not yet completed. Source, Long Creek, but was very muddy at my visit. The plant is very complete, has two Worthington pumps, two dynamos and filter, all in a new substantial brick building and a large reservoir adjoining. The works were yet in the hands of the engineers and contractor, who asked that the water be not yet sampled, and as John Love, the city treasurer and master spirit of the enterprise, concurred in the request, I came away without samples. The reservoir was half full, but the pipes were not yet charged, and, technically, it was not yet municipal water.

STATESVILLE.

Water from deep wells. Sewerage system not completed. Sample No. 12, taken from Dr. Hill's drug store, has been analyzed once.

Chemical Analysis.

Total solid matter in solution and suspension	4.1	gr. per U. S. gal.
Hardness	2.00	deg. Clarke's sc.
Equivalent to calcium carbonate	1.00	gr. per U. S. gal.
Chlorine	.25	gr. per U. S. gal.
Free ammonia	.0465	parts per mil.
Albuminoid ammonia	.0612	parts per mil.
Nitrogen as nitrates	.138	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Pate.

No. of sample, 12; source, Statesville; date, October 5, 1900; number of bacteria per C. C., 5493; fermentation test (lactose bouillon, glucose bouillon), ferments; reaction, acid; litmus agar, blue and red colonies; gelatine, does not liquify; motility, slight; litmus milk, coagulated fourth day, heliotrope; potato, slight, moist growth; Elsner's, moulds; indol, trace. Remarks, suspicious.

REIDSVILLE.

No sewerage system. Water from a 29-foot well with small feeders, affording 350,000 gallons per day. Never analyzed. Samples No. 4, taken from tap in Dr. Sapp's drug store. This water is sold at 30 cents per 1,000 gallons, and they are very proud of it.

Chemical Analysis.

Total solid matter in solution and suspension	5.8	gr. per U. S. gal.
Hardness	3.55	deg. Clarke's sc.
Equivalent to calcium carbonate	2.55	gr. per U. S. gal.
Chlorine	.40	gr. per U. S. gal.
Free ammonia	.0610	parts per mil.
Albuminoid ammonia	.0851	parts per mil.
Nitrogen as nitrates	.627	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Anderson.

I found 21 colonies to the cubic centimeter from the analysis made of drinking water sent by Colonel Shaffer from Reidsville, N. C. All benign. The water is good.

ROCKY MOUNT.

Water and sewerage systems, but the latter limited in extent. Source of supply, Rocky Creek, which, but for one mill-pond, would be practically unexceptionable. Samples No. 21, from tap in Griffin's drug store.

Chemical Analysis.

Total solid matter in solution and suspension	4.8	gr. per U. S. gal.
Hardness	3.30	deg. Clarke's sc.
Equivalent to calcium carbonate	2.30	gr. per U. S. gal.
Chlorine	.40	gr. per U. S. gal.
Free amomnia	.0724	parts per mil.
Albuminoid ammonia	.1130	parts per mil.
Nitragen as nitrates	Trace.	
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Anderson.

The sample of drinking water sent by Colonel A. W. Shaffer from the public water supply of Rocky Mount shows 42 colonies to the C. C. This water is good, as shown by analysis for bacteria.

TARBORO.

Tarboro possesses both a water and sewerage system, the former from driven wells near the river above town. It is the property of the city. Samples No. 20, taken from Zoeller's drug store tap.

Chemical Analysis.

Total solid matter in solution and suspension	7.4	gr. per U. S. gal.
Hardness	4.00	deg. Clarke's sc.
Equivalent to calcium carbonate	3.00	gr. per U. S. gal.
Chlorine	.60	gr. per U. S. gal.
Free ammonia	.0414	parts per mil.
Albuminoid ammonia	.0556	parts per mil.

Bacteriological Analysis by Dr. Anderson.

There were only six colonies to the C. C. in the bacteriological analysis of sample of drinking water sent me by Colonel A. W. Shaffer from Tarboro. The sample is very good.

SALEM.

No change in general conditions since last report.

Chemical Analysis.

Total solid matter in solution and suspension	3.3	gr. per U. S. gal.
Hardness	1.90	deg. Clarke's sc.
Equivalent to calcium carbonate	.90	gr. per U. S. gal.
Chlorine	.35	gr. per U. S. gal.
Free ammonia	.0774	parts per mil.
Albuminoid ammonia	.0671	parts per mil.
Nitrogen as nitrates	.32	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Pate.

No. of sample, 7; source, Salem; date, October 3, 1900; number of bacteria per C. C., 120; fermentation test (lactose bouillon, glucose bouillon), does not ferment; reaction, acid; litmus agar, blue colonies; gelatine, does not liquify; motility, slight; litmus milk, coagulated fourth day; potato, yellow, moist growth; Elsner's, no growth; indol, none. Remarks, water good.

NEW BERN.

General condition same as heretofore.

Chemical Analysis.

Total solid matter in solution and suspension	11.4	gr. per U. S. gal.
Hardness	7.70	deg. Clark's sc.
Equivalent to calcium carbonate	6.70	gr. per U. S. gal.
Chlorine	.75	gr. per U. S. gal.
Free ammonia	.0187	parts per mil.
Albuminoid ammonia	.0629	parts per mil.

Bacteriological Analysis by Dr. Pate.

No. of sample, 19; source, New Bern; date, November 22, 1900; number of bacteria per C. C., 124; fermentation test (lactose bouillon, glucose bouillon), does not ferment; reaction, acid; litmus agar, blue colonies; gelatine, does not liquify; motility, slight; litmus milk, not coagulated; potato, white, dry; Elsner's, no growth; indol, none. Remarks, water good.

SALISBURY.

No change in general condition since last report.

Chemical Analysis.

Total solid matter in solution and suspension	4.7	gr. per U. S. gal.
Hardness	3.30	deg. Clarke's sc.
Equivalent to calcium carbonate	2.30	gr. per U. S. gal.

Chlorine	.30	gr. per U. S. gal.
Free Ammonia	.0759	parts per mil.
Albuminoid ammonia	.0922	parts per mil.
Nitrogen as nitrates	.175	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Anderson.

The sample of drinking water sent from Salisbury by Colonel Shaffer shows 22 colonies to the C. C. The water is good.

WILSON.

No change in general condition since my last inspection.

Chemical Analysis.

Total solid matter in solution and suspension	3.2	gr. per U. S. gal.
Hardness	1.15	deg. Clarke's sc.
Equivalent to calcium carbonate	.15	gr. per U. S. gal.
Chlorine	.35	gr. per U. S. gal.
Free ammonia	.0640	parts per mil.
Albuminoid ammonia	.2120	parts per mil.
Nitrogen as nitrates	.19	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Anderson.

The sample of municipal water drawn by me at request of Colonel Shaffer from the Wilson water-works on the 22d day of October, 1900, shows 56 colonies to C. C., all of which are of benign form. The water is good.

WINSTON.

General conditions unchanged since my last inspection.

Chemical Analysis.

Total solid matter in solution and suspension	3.0	gr. per U. S. gal.
Hardness	1.75	deg. Clarke's sc.
Equivalent to calcium carbonate	.75	gr. per U. S. gal.
Chlorine	.30	gr. per U. S. gal.
Free ammonia	.0685	parts per mil.
Albuminoid ammonia	.0695	parts per mil.
Nitrogen as nitrates	.307	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Pate.

No. of sample, 6; source, Winston; date, October 3, 1900; number of bacteria per C. C., 80; fermentation test (lactose bouillon, glucose bouillon), does not ferment; reaction, acid; litmus agar, blue colonies; gelatine, does not liquify; motility, active; litmus milk, not coagulated sixth day; potato, slight, moist growth; Elsner's, no growth; indol, none. Remarks, water good.

HENDERSON.

No change in general conditions since last report.

Chemical Analysis.

Total solid matter in solution and suspension	4.4	gr. per U. S. gal.
Hardness	1.35	deg. Clarke's sc.
Equivalent to calcium carbonate	.35	gr. per U. S. gal.
Chlorine	.40	gr. per U. S. gal.
Free ammonia	.1009	parts per mil.
Albuminoid ammonia	.4121	parts per mil.
Nitrogen as nitrates	.272	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Pate.

No. of sample, 2; source, Henderson; date, September 21, 1900; number of bacteria per C. C., 320; fermentation test (lactose bouillon, glucose bouillon), does not ferment; reaction, acid; litmus agar, blue colonies; gelatine, does not liquify; motility, active; litmus milk, not coagulated fourth day; potato, moist growth; Elsner's, no growth; indol, none. Remarks, water fair.

GOLDSBORO.

General conditions unchanged since last report.

Chemical Analysis.

Total solid matter in solution and suspension	4.1	gr. per U. S. gal.
Hardness	.00	deg. Clarke's sc.
Equivalent to calcium carbonate	.00	gr. per U. S. gal.
Chlorine	.30	gr. per U. S. gal.
Free ammonia	.0559	parts per mil.
Albuminoid ammonia	.1863	parts per mil.
Nitrogen as nitrates	.255	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Anderson.

The bacteriological analysis of sample of water sent from Goldsboro public supply shows 33 colonies to the cubic centimeter. All tests show the water to be good. Sample forwarded by Colonel Shaffer September 28, 1900.

FAYETTEVILLE.

This city has two systems of water-works, owned by different parties. One taken from the run of Cross Creek, a fine, clear, strong, living stream, the other from the springs on Haymount Hill. Having taken my samples from the latter two years ago, I took this year's samples, numbered 16, from Cross Creek water, a running street hydrant at the market-house.

Chemical Analysis.

Total solid matter in solution and suspension	2.7	gr. per U. S. gal.
Hardness	1.00	deg. Clarke's sc.
Equivalent to calcium carbonate	.00	gr. per U. S. gal.
Chlorine	.30	gr. per U. S. gal.
Free ammonia	.0504	parts per mil.
Albuminoid ammonia	.1037	parts per mil.
Nitrogen as nitrates	Trace.	
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Pate.

No. of sample, 16; source, Fayetteville; date, November 23, 1900; number of bacteria per C. C., 80; fermentation test (lactose bouillon, glucose bouillon), does not ferment; reaction, acid; litmus agar, blue colonies; gelatine, does not liquify; motility, slight; litmus milk, not coagulated; potato, very slight growth; Elsner's, none; indol, none. Remarks, water good.

ASHEVILLE.

The general condition as to supply and plant are the same as at last report.

Chemical Analysis.

Total solid matter in solution and suspension	3.2	gr. per U. S. gal.
Hardness	1.10	deg. Clarke's sc.
Equivalent to calcium carbonate	.10	gr. per U. S. gal.
Chlorine	.20	gr. per U. S. gal.
Free ammonia	.0537	parts per mil.
Albuminoid ammonia	.0742	parts per mil.
Nitrogen as nitrates	.197	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Anderson.

The sample of drinking water sent from Asheville by Colonel Shaffer shows 52 colonies to the C. C., all benign. The water is good.

RALEIGH.

This company since last biennial report and inspection have practically installed a new filter plant of the improved Hyatt type, consisting of two new filters of the New York Filter Manufacturing Company's gravity type, having a capacity of 500,000 gallons each in 24 hours, and changing the three old iron filters from the old pressure type to conform to the new, or gravity filter. These three have an aggregate capacity of 1,000,000 gallons, and a settling tank has been added with a capacity of 1,000,000 gallons. The plant now comprises the very latest improvements in mechanical filtration and has an aggregate capacity of 2,000,000 gallons of water per day of 24 hours.

Chemical Analysis.

Total solid matter in solution and suspension	2.8	gr. per U. S. gal.
Hardness	1.55	deg. Clarke's sc.
Equivalent to calcium carbonate	.55	gr. per U. S. gal.
Chlorine	.30	gr. per U. S. gal.
Free ammonia	.0426	parts per mil.
Albuminoid ammonia	.0740	parts per mil.
Nitrogen as nitrates	.1975	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Pate.

The sample of water sent to me by Colonel Shaffer July 14th, from Raleigh, N. C., shows 76 colonies to the C. C., all of which are of the benign form. The water is good.

GREENSBORO.

Water was very low and very muddy, with universal complaint everywhere. It was so low and so bad that a pending contract for its purchase by the city was cancelled. Samples No. 5 were taken from the faucet of Holtón's drug store on Main street. The State Normal and Industrial College were filtering and boiling all their water.

Chemical Analysis.

Total solid matter in solution and suspension	8.7	gr. per U. S. gal.
Hardness	2.40	deg. Clarke's sc.
Equivalent to calcium carbonate	1.40	gr. per U. S. gal.

Chlorine	.35	gr. per U. S. gal.
Free ammonia	.0745	parts per mil.
Albuminoid ammonia	.2773	parts per mil.
Nitrogen as nitrates	.44	parts per mil.
Nitrogen as nitrites	Trace.	

Bacteriological Analysis by Dr. Anderson.

There were 604 colonies found in the bacteriological analysis of water sent to me by Colonel Shaffer from Greensboro, some of which were intestinal bacilli. The water is not good.

DURHAM.

I found Durham water very low, very turbid, pumping from both sources of supply, the creek and river, and the supply inadequate in case of fire. Samples numbered 24, taken from street hydrant, corner Main and Cochran streets.

Chemical Analysis.

Total solid matter in solution and suspension	3.3	gr. per U. S. gal.
Hardness	1.75	deg. Clarke's sc.
Equivalent to calcium carbonate	.75	gr. per U. S. gal.
Chlorine	.40	gr. per U. S. gal.
Free ammonia	.0812	parts per mil.
Albuminoid ammonia	.1084	parts per mil.
Nitrogen as nitrates	.200	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Anderson.

The sample of water sent by Colonel Shaffer, September 19, 1900, from Durham, shows 76 colonies to the cubic centimeter, slightly infected with intestinal bacilli. The water is not good.

Second analysis one week later.

The last sample of drinking water sent me for bacteriological analysis shows only 22 colonies to the C. C., all of which are of benign form. The water is good, as shown from the analysis of this sample.

CONCORD.

Water-shed has been greatly improved by removal of all closets from the surface and clearing up the grounds. Samples No. 6, taken from faucet in Dr. Johnson's drug store, who balanced off old scores on account of a former report by charging fifty cents for an empty bottle. The town is agitating a new water supply from a small lake, three miles out, of excellent water.

Chemical Analysis.

Total solid matter in solution and suspension	11.8	gr. per U. S. gal.
Hardness	5.25	deg. Clarke's sc.
Equivalent to calcium carbonate	4.25	gr. per U. S. gal.
Chlorine	1.60	gr. per U. S. gal.
Free ammonia	.0534	parts per mil.
Albuminoid ammonia	.0444	parts per mil.
Nitrogen as nitrates	7.02	parts per mil.
Nitrogen as nitrites	None.	

Bacteriological Analysis by Dr. Pate.

No. of sample, 9; source, Concord; date, October 6, 1900; number of bacteria per C. C., 1,680; fermentation test (lactose bouillon, glucose bouillon), ferments; reaction, acid; litmus agar, red and blue colonies; gelatine, does not liquify; motility, slight; litmus milk, coagulated third day, pink; potato, yellowish, dry growth; Elsner's, pale pink colonies; indol, considerable. Remarks, intestinal bacillus.

CHARLOTTE.

Charlotte has purchased its water-works from the original company and greatly improved its water-shed, machinery and service, but the supply is inadequate and not creditable to that enterprising city. Samples numbered 10, taken from faucet in Dr. Jordan's drug store, corner of Trade and Tryon streets.

Chemical Analysis.

Total solid matter in solution and suspension	6.7	gr. per U. S. gal.
Hardness	3.00	deg. Clarke's sc.
Equivalent to calcium carbonate	2.00	gr. per U. S. gal.
Chlorine	.30	gr. per U. S. gal.
Free ammonia	.0828	parts per mil.
Albuminoid ammonia	.0897	parts per mil.
Nitrogen as nitrates	.202	parts per mil.
Nitrogen as nitrites	None	

Bacteriological Analysis by Dr. Pate.

No. of sample, 10; source, Charlotte; date, October 8, 1900; number of bacteria per C. C., 80; fermentation test (lactose bouillon, glucose bouillon), no fermentation; reaction, acid; litmus agar, blue colonies; gelatine, does not liquify; motility, active; litmus milk, coagulated fourth day; potato, white, elevated, moist; Elsner's, moulds; indol, none. Remarks, water good.

WILMINGTON.

Wilmington continues to take her water from North East River, just above its junction with the Cape Fear, a little north of the corporation limits, but much of its drinking water is derived from cisterns, in which they have great faith and bestow upon them great care. The city is unprovided with a system of sewerage, and to this, I think, may be ascribed their escape from an epidemic of typhoid. With such a system emptying its sewage into the river from every street reaching its banks, to ebb and flow with the tides and be forced up the North East River shore, past the intake by the counter currents of Cape Fear River and the incoming tides, how could they escape the devastating epidemic who are destitute of cisterns?

The company has devoted three years of labor and large sums of money in an effort to reach pure water through an artesian well at the intake in the upper end of the town. They went down 700 feet, but finding only salt sea water, unfit for use, they abandoned it and started another some ten feet away from the first. This last is now over 1,300 feet in depth, with salt sea water boiling out of the pipe. But the operators, believing that good water lies below, and possessed with the courage of their convictions, declare they will find water there or tap the level of Charleston's well (2,000 feet) before they give it up. Their courage and perseverance deserve success. Let us hope it will come to them soon and abundant, even though an inexhaustible supply of the finest water earth affords flows past them continuously on the surface, and can be reached beyond contamination a few miles above.

Samples numbered 18, taken from faucet in Dr. ——'s drug store, adjoining The Orton House.

Chemical Analysis.

Total solid matter in solution and suspension	4.5	gr. per U. S. gal.
Hardness	2.00	deg. Clarke's sc.
Equivalent to calcium carbonate	1.00	gr. per U. S. gal.
Chlorine	.50	gr. per U. S. gal.
Free ammonia	.1447	parts per mil.
Albuminoid ammonia	.2839	parts per mil.

Bacteriological Analysis by Dr. Pate.

No. of sample, 18; source, Wilmington; date, November 23, 1900; number of bacteria per C. C., 400; fermentation test (lactose bouillon, glucose bouillon), does not ferment; reaction, acid; litmus agar, blue and red colonies; gelatine, does not liquify; motility, active; litmus milk, coagulated fourth day; potato, slight, moist growth; Elsner's, moulds; indol, trace. Remarks, no suspicious organisms isolated; water safe.

The numbered samples referred to are the private numbers on the samples taken out from each town, one to Bacteriologist, the other to Chemist, both bearing the same number from any one town. It was believed to be well to do this, that only the Board might possess the key to the sources of the water, but the express company generally labeled the boxes under their rules.

I am of the opinion that very few water companies comply with the law respecting quarterly analyses, and I saw no indication of intention to do so, judging from the indifference with which the circulars of the Board were received from me. It is not so with the city authorities who do not own their own works. These received them gladly, and I think it would be a good plan to send duplicates to the mayors.

I see but one way to compel these analyses, or ascertain whether they are made, viz.: let the law provide that the companies shall file a copy of each analysis with the Board, or better still, that the State Chemist and State Bacteriologist shall make the analyses, and themselves furnish a copy. This last would be effectual. This would do away with the necessity of the expensive biennial sampling and inspection by this Board, which increases with increasing municipal water-works.

All of which is respectfully submitted.

RALEIGH, N. C., December 1, 1900. A. W. SHAFFER, S. E.

[*From the Bulletin for December, 1900.*]

ANOTHER ADVANCE IN SANITATION IN NORTH CAROLINA.

As our readers already know, the appropriation made by the State to the Board of Health is quite small, entirely insufficient for the proper administration of such a bureau. Bacteriology now plays such an important part in the elucidation of the problems of disease that no equipment of a State health board can be considered complete without a bacteriological laboratory. We made an attempt in this direction before the Legislature of 1899 by incorporating in "An Act to Protect Water Supplies" a section appropriating annually $500 for this work, but the celerity, the almost vicious celerity, we might say, with which this section was stricken out made us despair. But learning early last spring that the State Board of Agriculture proposed establishing a bacteriological laboratory for its own special work, and not caring particularly under which name or who received the credit so the object was attained, a ray of hope appeared. We brought the matter to the attention of our Board at its annual meeting in May and the following preamble and resolutions were adopted:

WHEREAS, Typhoid fever, with the exception of tuberculosis, is the most fatal to our people of all the preventable diseases, the number of deaths in the State from that cause alone annually being more than 1,000, and the number of cases that recover probably ten times as many; and

WHEREAS, This disease is nearly always conveyed by infected drinking water, which infection can be only ascertained by a bacteriological examination; and

WHEREAS, The appropriation made by the State for the work of the Board of Health is entirely inadequate to provide for more than a very few such examinations of the public water supplies during each biennial period; and

WHEREAS, We have been informed that the Board of Agriculture proposes to establish a bacteriological laboratory, with an expert in charge, for the prosecution of its work in relation to pure food and to the diseases of animals; therefore

Resolved. That the said Board of Agriculture be respectfully requested, for the good of the people of the State, to slightly and inexpensively extend the scope of its laboratory so as to include investigations into the purity of suspected drinking waters, especially of wells and springs in the country districts, said investigations to be made upon the request of the Secretary of the Board of Health, under such regulations and restrictions as the Board of Agriculture may prescribe.

Resolved, That if the Board of Agriculture considers this request favorably, the Secretary and the Engineer of the Board of Health confer with the officials or the committee having the matter in charge upon request, and arrange with them the details of the work.

The matter was brought before the Board of Agriculture at its meeting in June, and our request promptly and cheerfully granted. The order for the additional apparatus necessary was made, but the election of a bacteriologist was postponed until inquiries could be made as to the proper man. This step, however, was taken at the regular meeting in December, and Mr. Gerald McCarthy, who has done much work of this character, was elected.

It is proposed to examine, as soon as possible, the water supplies of all the State institutions and large schools, private as well as public, in order to establish their normal standard, and also the waters of all suspected wells and springs. The work cannot be done for mere fancy, simply to gratify the curiosity of one who just wants to know whether there are any "bugs" in his well, but only where there is reasonable ground to suspect the water of causing disease. Application for bacteriological analyses should be made through the Secretary of the Board of Health. As the main motive is to help the farmers, we hope our country physicians, particularly, having cases of typhoid fever, will avail themselves of the services offered.

We cannot commend too highly the liberal and progressive spirit shown in this matter by the Board of Agriculture. We feel sure that more real good to the people, especially the country people, will come from the small expenditure for this purpose than from an equal amount devoted to any other work.

We append a paper on the subject by Mr. McCarthy:

BIOLOGICAL EXAMINATION OF WATER SUPPLIES.

BY GERALD McCARTHY,

Botanist, North Carolina Department of Agriculture.

Modern sanitarians are a unit in declaring that the first requisite for the healthfulness of any neighborhood is a water supply uncontaminated by human and animal excrements. Were good health held at its proper value, even from a financial stand-point, every public water supply and private wells and springs would be systematically examined at intervals short enough to prevent the unconscious use of contaminated water.

Massachusetts was the first State in the Union to undertake a systematic study of the public water supplies. The work there started in 1887 has marked the beginning of a new era in sanitary science. The New England States and New York now make over 10,000 annual biological water analyses. The Southern States, on account of their warmer climate and consequently more rapid development of micro-organisms, and the presence of a large, ignorant and shiftless laboring population, are much more liable than the New England States are to have polluted water supplies. Yet here practically nothing has been done towards systematic examination of the purity of drinking water.

"Pure water," in a sanitary sense, is a relative term. Absolutely pure water does not exist in nature. The water of deep artesian wells and gushing springs, and rain-water caught on a clean surface after the atmosphere has been washed free of dust, are the purest natural waters.

An unfiltered water containing less than 500 bacteria per cubic centimeter is considered very pure. The "purified" water supplied by city water companies usually contains from 5,000 to 20,000 bacteria per C. C. Most of these water bacteria are innocuous, but where they exist in large numbers pathogenic species are also liable to gain an entrance and multiply with disastrous results to the public.

A complete analysis of potable water should be threefold, viz.: Biological, physical and chemical. Where only partial analysis is given, by far the most important is the biological examination. The purpose and real value of analysis of potable water is misunderstood, even by many professed sanitarians! Except when testing for mineral constituents and metallic poisons, no sanitary analysis of water can do more than afford indications upon which the analyst may base a judgment of the quality of the supply. But many other factors must enter into such a judgment. The local environment, geology, climatology, the number and social condition of the population living upon the water-shed, are all prime factors in forming such a judgment. Another thing to be understood is, that isolated, occasional examinations of water supplies possess very little intrinsic value. It is first necessary to determine, by a course of systematic examinations, the normal biology of the water supply. After this point is attained, subsequent work consists mainly in noting deviations from the normal mean. Any considerable variation from the mean indicates pollution from some source. A competent biologist can, from knowledge of the local environment and the specific character of the germs, determine their approximate source. To be of real protection to the consumers of water, such examinations must be sufficiently frequent to make it impossible for any dangerous bacterial invasion to escape notice. To insure safety, a biological and physical examination of water supplies should be made once a week and a chemical examination once a month.

Water from deep wells is much less liable to sudden changes, or variations from its mean biology, than is surface-water. But any drinking water supply, which suddenly alters its usual taste, odor or color, should be at once examined by a competent biologist. In the meantime such water should not be used unless it is first sterilized by boiling.

A few words upon domestic filters may not be out of place here. There are numerous patent forms upon the market. Upon all of these, except those of the Pasteur-Chamberland type, the biologist must pronounce an anathema! After being used a short time these filters pollute instead of purifying water. They collect and concentrate the filth suspended in the water and this forms a breeding nest for the microbes far more favorable for their increase than the original unfiltered water was! Many river waters carry considerable sediment, which render them unsightly. This sediment is easily removed by any form of filter, but such removal is a matter of æsthetics rather than health. The limpid, clear filtrate may be far more dangerous than the turbid unfiltered water. The safest way to clear a turbid drinking water is to filter it through a clean thin white flannel.

The organisms and detritus commonly found in surface-water supplies may be grouped as follows:

1. Plants.—Algæ, fungi, bacteria.
2. Animals.—Infusoria, crustaceans, worms.
3. Detritus.—Hairs, fibres, scales and fœcal matter.

The algæ of sanitary importance most frequently found in Southern waters, are as follows:

(*a*) *Diatoms.*—Asterionella, melosira and synedra. All these secrete an oily matter which gives a disagreeable, fishy taste to water.

(*b*) *Blue-green Algæ.*—Anabæna, clathrocystis and oscillaria. These also give water a bad taste and their presence indicates serious organic pollution.

(*c*) *Grass-green Algæ.*—Palmella, eudorina, volvox, protococcus, and spirogyra. The first three give a bad taste to water. The last two are not usually present in water fit for human consumption.

Of crustaceans our surface-waters contain cyclops, daphnia and bosmina, all of which are characteristic of impure water.

Of infusoria, among many other genera, we find the following of special sanitary interest: Cryptomonas, dinobryon, peridinium, synura, uroglena, spongilla and pectinatella. All of the above infusorians give various strange tastes and smells to waters, generally of an "ancient and fish-like" kind. Spongilla and pectinatella often clog the service pipes of city water systems. Of protozoans in our waters, we may suspect the hæmatozoans which cause malarial fevers, and amœbæ which cause dysentery in humans and cattle. Severe losses of cattle occur in some of the swampy sections of North Carolina, the chief symptoms being those common to dysentery.

Of parasitic, intestinal worms, waters often harbor the eggs and spores of the various tape and thread-worms common to men and animals. The worm parasites of sheep are especially abundant where these animals come to drink, and such spots serve to inocculate the young lambs.

Of detritus commonly found in waters, we may mention the hairs of rats and mice and scales of fishes, indicating decaying bodies in the supply. Epithelial scales and particles of amorphous fœcal matter indicate gross and direct contamination by dejecta.

The fungi usually found in water are molds, a few species of Phycomyces parasitic on fishes, and yeasts. Yeasts are certain indication of sewage pollution.

Bacteria are by far the most important organisms, from a sanitary stand-point, found in water supplies. The bacterial flora of water is very large and is from a systematic stand-point badly confused. The greater number of species are, however, harmless and even useful species. But waters rich in harmless bacteria are liable at any time to receive and encourage the development of pathogenic species. Of pathogenic bacteria the one species of overshadowing importance in America is the typhoid germ—*bacillus typhosus*. The cholera bacillus is of great importance in other regions, but does not occur in American waters. The bacilli of anthrax, hog cholera, cerebro-spinal meningitis and other diseases are often disseminated with drinking water.

Besides the bacteria above mentioned there are various genera of so-called thread, sulphur and iron bacteria which cause water companies serious trouble by filling service-pipes and mains and thus hindering proper circulation.

In a sanitary analysis of water the bacteria especially sought for are those of the fæcal group; of which the type is bacillus coli-communis. The typhoid bacillus, hog cholèra bacillus and swine plague bacillus are the most important members of this group. Bacillus enteritidis sporogenes, B. cloacæ and B. amethyskins are other bacteria characteristic of sewage.

The difficulty and expense of making a bacteriological examination of water is such that many scientists have sought for a simple chemical method for determining the presence of bacteria in potable waters. Most of these chemical tests are based upon the assumption that the presence of nitrites in water is an index of the presence of bacteria, since the oxidation of ammonia to nitric acid in soil and water and the reverse process of reduction are due chiefly to bacterial activity. There are various chemicals which unite with dissolved nitrites to color the solution red or yellow. The standard test for nitrites in bacteriological analysis is sulphanitic acid and naphthylamine. These reacting with dissolved nitrites color the solution red. An enterprising German chemist has recently placed upon the market, under the trade name of "Healthin," a compound of this class for which he makes the following claims:

1. That the presence of nitrites in potable water is an index of bacterial pollution.

2. That nitrites—nitrous acid—is the chief product of the life activity of bacillus typhosus and B. cholera-asiaticæ.

2. That the dose of "Healthin" recommended will, when added to a tumblerful of water, infallibly determine whether such water has been polluted by sewage bacteria, including the two capital species above named.

In regard to these claims the writer is prepared to assert and prove (1) That while the presence of nitrites is always a bad sign, the absence of nitrites from a water sample does not always indicate a safe or pure water. (2) That the formation of nitrites, or what is usually the real case, the reduction of nitrates to nitrites, is not the result of the activity or growth of B. typhosus. Bacillus typhosus does not reduce nitrates. A sample of water may be swarming with typhoid germs and yet fail to give the nitrite re-action! (3) That the dependence upon "Healthin," or any other single test for indicating the potable quality of water, is inadequate, unwise, and liable to lead to disastrous results.

There is but one short and ready test that can be safely recommended for domestic use. This is the odor of the water after it has been heated to near the boiling point in a closely stoppered bottle. Take a clean four-ounce wide-mouth bottle, fill with suspected water and cork tightly. Place bottle in a pan or kettle of water and heat until the water in outer vessel begins to boil. Then remove bottle, uncork and quickly apply nose to mouth of bottle. If polluted by sewage a distinct but evanescent odor of urine or fæces can be detected. This test can be made more delicate by adding to the heated water one-half its volume of sulphuric ether. Shake the mixture vigorously for a few minutes. Replace cork and invert the bottle for five or ten minutes. The ether will rise to the surface. Now carefully loosen the cork and allow the water to drip away. Let the bottle stand uncorked until the ether evaporates. Smell the residue.

Water samples for biological analysis need not necessarily exceed four fluid ounces. But larger samples are sometimes desirable. The utmost care is needed to prevent accidental contamination while collecting the sample. The writer has devised a method whereby satisfactory samples for biological analysis can be sent by mail in ordinary mailing tubes. Express service is, however, always to be preferred.

As it seems desirable in the interest of public health that more attention should be paid to quality of drinking water, more especially that used in country neighborhoods, the State Department of Agriculture will make such examinations for citizens free of charge. But the samples must be taken in vessels furnished by the Department, and according to instructions, which will be sent to those who apply for analyses. Applications should be made to the Commissioner of Agriculture at Raleigh. Applicants will be required to pay postage or expressage both ways on bottles and samples.

The attention of health officers, country physicians and veterinarians is especially called to this offer, which, if utilized, cannot fail to elucidate the dissemination of many infectious diseases and prevent epidemics among men and animals.

DIRECTIONS FOR COLLECTING SAMPLES OF WATER.

If samples are to be mailed two four-ounce phials are sufficient. If to go by express two pint jars should be sent. To one of the pair of samples must be added 0.1 per cent. of Parietti's fluid. This fluid will prevent growth of all but fœcal bacteria while the sample is in transit. The second sample is intended to show the normal bacteria, algæ and other organisms present in the water. Both samples must be taken from same place and at same time.

Just before taking the samples wash the hands and arms thoroughly with hot water and soap. Dry on a clean fresh towel. Clean the finger nails.

If sample is from a pump, hydrant or tap let the water run to waste for a few minutes before filling bottles. If from a stream, pond or reservoir select a place as free as possible from mud or sediment. If from a spring or open well draw a bucketful in the usual way and take the samples from this.

To take the sample grasp the bottle near the bottom and lower it until top is below surface—go as deep as possible without striking bottom. With other hand open the bottle under water and allow it to fill to within one inch of top. Cover again under water. Now withdraw bottle, seal or stopper tightly and wipe dry. Return to carrying case and forward as soon as possible. In bottles and jars sent from the Department the Parietti fluid, or a little sugar holding it, will be enclosed in one of the bottles.

CHEMICAL ANALYSES OF SUNDRY DRINKING WATERS BY THE STATE CHEMIST.

No.	Name and Address.	Location.	Total Solids.	Hardness.	Calcium Carbonate.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrogen as Nitrates.	Nitrogen as Nitrites.
10727	J. A. Harward, Durham	Well	137.7	42.5	34.58	56.42	0.0216	0.1100		
10729	J. L. Burns, Raleigh	Well in Capitol	11.50	.5	3.33	1.33	.066	.0600		
10730	D. W. Cummings, Burlington	Well	3.66	2.2	1.00	.33	.0166	.055		
10731	A. G. Sexton, Biscoe	Well	5.08	2.9	1.58	.92	.0083	.1037		
10737	C. H. Goodrich, Asheville		6.17	4.6	3.	.92	.20	.1662		
10738	J. W. Propst, Hickory	Well	1.25	1.3	.25	.12	.013	.065		
10751	Jas. Norwood, Raleigh	Hydrant at station-house	16.92	12.	9.17	.25	.066	.0338	Trace	
10752	A. M. McPheeters, Raleigh	Hydrant in laboratory	17.	12.	9.17	.25	.05	.0362		
10753	A. M. McPheeters, Raleigh	Sand pit, city supply	20.5	16.3	12.75	.25	.0642	.0925		
10754	A. M. McPheeters, Raleigh	Intake, city supply	3.66	1.5	.42	.21	.020	.09		
10755	H. E. Knox, Jr., Charlotte	Surface branch	2.83	1.16	.50	.17	.020	.0875	Very small	
10756	H. E. Knox, Jr., Charlotte	Driven well	8.58	6.6	4.66	.25	.0149	.0275		
10757	W. J. Green, Fayetteville	Tokay	1.92	2.30	1.08	.50	.0166	.0199		
10761	A. W. Knox, Raleigh	No. 1	9.83	8.00	5.83	.29	.046	.0367		
10762	G. B. Perry, Franklinton		9.17	2.90	1.58	2.50	.0182	.1000	Considerable	
10767	C. Giles, Wilmington	"G"	4.00	4.10	2.58	.25	.0066	.0725	Small	
10778	R. H. Stancell, Margarettsville		8.33	2.30	1.08	.66	.233	.0287	Trace	
10783	L. L. Staton, Tarboro	"A"	6.92	4.40	2.83	.29	.058	.0225		
10784	L. L. Staton, Tarboro	"B"	7.83	4.00	2.50	.29	.03	.029		
10785	Jas. McKee, Raleigh	"B"	6.17	2.30	1.08	.50	.304	.190	Trace	
10787	W. H. Worth, Raleigh		23.25	10.40	7.53	5.00	.013	.121	Considerable	
10788	H. L. Smith, Davidson	Well No. 4	6.25	3.90	2.42	.25	.0033	.0212	Trace	
10789	H. L. Smith, Davidson	Well No. 7	6.17	3.80	2.33	.25	.0066	.03		
10791	J. W. Murchison, Wilmington		4.08	2.70	1.42	.75	.153	.14	Trace	
10792	W. O. Warren, Old Sparta	"W"	13.58	4.60	3.00	.83	.353	.0325		
10796	W. J. Love, Wilmington	W. J. L.	5.08	3.90	2.42	.25	.0233	.153	Small	
10797	J. C. Horner, Oxford		8.92	4.30	2.75	.58	.027	.0375	Small amount	
10805	O. High, Whiteville		26.66	14.5	11.25	7.33	.02	.0674		
10806	W. E. Perdew, Wilmington		2.50	2.40	1.17	.21	.0066	.0512	Small	
10807	J. C. Bellamy, Whitakers	Well	5.08	1.70	.58	1.08	.03	.1235	Small amount	
10808	W. M. Parker, Trinity	Spring	5.92	5.10	3.42	.79	.033	.0275	Small amount	
10809	D. Oettinger, Wilson		14.17	3.20	1.83	5.08	.0183	.0787	Much	
10817	J. F. Harrell, Whiteville	No. 1	14.	11.65	8.88	.42	.043	.0747		
10818	J. F. Harrell, Whiteville	Well 12 feet deep	16.17	6.30	4.42	4.08	.023	.06	Considerable	

CHEMICAL ANALYSES OF SUNDRY DRINKING WATERS BY THE STATE CHEMIST—*Continued.*

No.	Name and Address.	Location.	Total Solids.	Hardness.	Calcium Carbonate.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrogen as Nitrates.	Nitrogen as Nitrites.
10820	W. H. Worth, Raleigh	Well	21.33	9.30	6.92	4.88	.0167	.0637	Considerable	
10828	W. E. Abernethy, Rutherford College		1.00	2.00	.83	.12	.0433	.0362		
10829	W. J. Edwards, Sanford		14.83	7.50	5.42	1.33	.02	.1662	Small amount	
10831	W. J. Hicks, Oxford	No. 2	3.83	1.80	.67	.50	.033	.030	Considerable	
10832	W. J. Hicks, Oxford	No. 3	4.67	2.50	1 25	.33	.04	.065	Trace	
10833	W. J. Hicks, Oxford	Well No. 4	.4.80	3.20	1.83	.33	.085	.052	Considerable	
10834	N. W. West, Raleigh	Well	27.83	10.9	8.25	10.58	.08	.0937	Considerable	
10835	W. J. Edwards, Sanford		15.42	8.25	6.04	1.50	.0282	.0625	Small amount	
10837	N. Ketchie, Mooresville	Well	4.33	1.60	.50	.62	.0233	.0475	Considerable	
10838	Butter's Lumber Company, Hub		2.17	1.90	.75	.42	.04	.0475	Small	
10839	Butter's Lumber Company, Hub		2.83	1.40	.33	.70	.033	.0425	Small	
10840	Butter's Lumber Company, Hub	Kitchen well near house	4.50	3.20	1.83	.62	.106	.0325	Considerable	
10841	Butter's Lumber Company, Hub	Well in yard of residence	3.00	3.10	1.75	.50	.0130	.0225		
10843	J. A. Alexander, Mayhews		6.42	3.80	2.33	.25	.0633	.04		
10844	J. G. Steed, Steeds		6.00	4.60	3.00	.25	.0660	.05		
10846	Mooresville Cotton Mills, Mooresville		6.17	3.20	1.83	.25	.0233	.0375		
10847	A. M. McPheeters, Raleigh	Well in Capitol Square	12.00	5.80	4.00	1.42	.026	.065	Considerable	
10850	G. W. White, Guilford College	Spring	7.08	3.10	1.75	.17	.0216	.0875		
10851	G. W. White, Guilford College	Founder's well	9.17	5.40	3.67	1.92	.01	.0125	Trace	
10853	D. S. MacRae, Fayetteville	Spring or well	3.25	1.60	.50	.29	.1730	.0875		
10866	T. H. Battle, Rocky Mount	Well	3.58	1.90	.75	.50	.020	.035	Considerable	
10867	S. Wittkowsky, Charlotte	Well	24.33	8.40	6.17	1.62	.0233	.07	Very large	
5	C. Giles, Wilmington		11.42	2.9	1.59	2.00	.0698	.234		
6	C. Giles, Wilmington		35.08	8.4	6.17	14.3	.0334	.1824		
24	H. B. Hart, Rocky Mount		10.58	3.9	2.42	2.25	.054	.060		
28	F. Andrews, Far Landing		16.83	4.5	2.91	6.08	.026	.036		
29	S. Wittkowsky, Charlotte		29.33	11.2	8.5	4.26	.072	.036		
35	G. W. White, Guilford College	Well	7.50	4.4	2.85	.67	.030	.020		
36	G. W. White, Guilford College	Well	2.5	1.6	.5	.33	.030	.016		
40	J. W. Miller, Charlotte		6.51	5.4	3.67	.25	.030	.042		
41	G. T. Leach, Washington		7.17	5.5	3.75	.42	.032	.012		
42	G. T. Leach, Washington		1.75	1.30	.25	.25	.056	.018		
43	G. T. Leach, Washington		4.42	2.40	1.17	.25	.198	.182		
46	McD. Ray, Hendersonville		2.25	1.0	.0	.17	.058	.027		

CHEMICAL ANALYSES OF SUNDRY DRINKING WATERS BY THE STATE CHEMIST—*Continued.*

No.	Name and Address.	Location.	Total Solids.	Hardness.	Calcium Carbonates.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrogen as Nitrates.	Nitrogen as Nitrites.
47	G. G. Thomas, Wilmington		7.51	2.9	1.51	2.08	.024	.012		
48	A. Sprunt & Son, Wilmington		20.33	13.5	10.42	1.75	1.334	.088		
54	E. C. Holt, Wilmington		10.66	11.6	9.6	.75	.032	.030		
55	McD Boyd, Culler		21.2	12.1	9.25	2.25	.096	.082		
59	G. F Weston, Biltmore		3.41	2.	.83	.25	.024	.074		
63	J. W. Hines, Rocky Mount	Big well	3.25	2.3	1.08	1.0	.098	.064		
64	J. W. Hines, Rocky Mount	Little well	8.75	1 1	.08	2.92	.106	.064		
71	G. B. D. Parker, Chinquapin		15.92	13.0	10.	.50	.01	.456		
72	G. B. D. Parker, Chinquapin		10.92	10.6	8.	.33	.134	.148		
77	B. S. Gardener, Old Sparta	Artesian well	12.08	2.8	1.5	.50	.333	.094		
78	James McKee, Raleigh		34.08	16.6	13.0	3.75	.058	.206		
79	James McKee, Raleigh		25.33	6.4	4.5	3.52	.038	.212		
80	J. M. McIver, Gulf		41.64	12.9	9.92	7.17	.054	.816		
85	T. B. Russell, Raleigh	Pond in Penitentiary	7.33	3.4	2.0	.92	.030	.044		
86	T. B. Russell, Raleigh	Well at Penitentiary	5.58	2.2	1.00	.42	.056	.100		
107	C. W. Raney, Kittrell	Raney's spring	3.42	1.9	.75	.42	.064	.062		
108	J. A. Withers, Leaflet		5.16	1.4	.33	1.08	.026	.052		
109	J. M. McIver, Gulf		38.58	10.7	8.08	5.92	.134	2.532		
118	J. C. Michie, Durham		2.66	1 3	.25	.33	.066	.084		
119	M. E. Robinson, Goldsboro	Goldsboro Water Company	3.25	1.5	.41	.41	.112	.262		
121	Gilliken & Bros., Beaufort		9.5	2.8	1.5	2.83	.018	.066		
122	S. G. Worth, Edenton	Artesian well	59.33	10.3	7.75	12.33	.410	.048		
130	H. H. Hyman, Tarboro		3.6	2.1	.91	7.08	.0233	.043		
133	N. M. Hill, Pittsboro		13.16	7.9	5.75	2.08	.093	.130		
134	W. E. Rankin, Asheville	Fire hydrant	2.25	1.00	.0	.16	.066	.118		
135	S. B. Newton, Xema		21.0	12.2	9.33	.62	.068	.496		
141	P. L. Bridgers, Wilmington		7.41	7.3	5.25	.29	.026	.145		
142	J. M. McIver, Gulf		14.25	11.6	8.83	1.58	.093	.090		
149	R. H. Strickland, Oswego		8.33	6.3	4.41	.58	.046	.010		
151	J. M. McIver, Gulf		28.58	16.5	12.75	6.41	.05	.075		
152	D. O. Brinkley, Plymouth		2.33	2.2	1.0	.41	.1568	.0675		
153	H. Hatcher & Sons, Selma		2.83	1.3	.25	.75	.0433	.1025		
155	Z. T. Brooks, Durham		14.41	10.1	7.58	1.58	.0666	.1050		
156	Z. T. Brooks, Durham		34.66	9.9	7.41	10.91	.08	.1975		

CHEMICAL ANALYSES OF SUNDRY DRINKING WATERS BY THE STATE CHEMIST—*Continued.*

No.	Name and Address.	Location.	Total Solids.	Hardness.	Calcium Carbonate.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrogen as Nitrates.	Nitrogen as Nitrites.
214	B. W. Best, Greensboro	Greensboro Water Supply, Buffalo Creek	5.08	3.3	1.91	.25	.05	.11	.10	.0925
232	Geo. T. Winston, Raleigh		3.3	1.00	0	.30	.02	.0237	.3	
233	G. T. Winston, Raleigh		3.0	1.30	.30	.35	.0925	.0075	.4	
234	R. E. Weaver, Spencer		3.8	2.70	1.70	.30	.0975	.04	.075	
243	M. E. Robinson, Goldsboro	Well	3.7	1.70	.70	.35	.1481	.15	.12	Trace.
244	M. E. Robinson, Goldsboro	Well	5.0	2.70	1.70	.35	.1250	.15	.15	Trace.
245	M. E. Robinson, Goldsboro	Well	4.0	1.00	.20	.35	.08	.1375	.076	
246	M. E. Robinson, Goldsboro	Well	3.9	1.20	.20	.35	.1150	.1525	.12	
247	M. E. Robinson, Goldsboro	Well at Graded School	7.4	4.40	3.40	1.50	.1425	.09	1.47	.006
249	W. A. Hoke, Lincolnton		5.8	1.90	.90	1.10	.0075	.0775	4.0	.0036
263	I. S. Roland, Rutherfordton		3.0	1.2	.2	.2	.0725	.0975	.35	Trace.
372	H. C. Sprinkle, Pineville		31.9	16.05	15.05	3.55	.115	.1728	6.25	Trace.
273	C. C. Chadbourn, Castle Hayne		19.8	15.50	14.50	1.00	.095	.130	.65	
304	Mrs. J. W. Hinsdale, Raleigh	Pump at cor. Hillsboro and Harrington Sts.	12.	5.30	4.30	2.15	.2096	.0639	2.22	Strong test.
315	J. W. Murchison, Wilmington		9.2	7.10	6.10	.8	.0374	.0537	Trace	
323	E. B. Bain, Raleigh	Raleigh Water Co.	3.5	1.5	.5	.30	.0574	.0535	Trace	
325	W. J. Hicks, Oxford		3.0	1.7	.7	.35	.0606	.1214	Trace	
326	W. J. Hicks, Oxford		3.7	1.8	.8	.40	.0449	.0402	1.00	
327	W. J. Hicks, Oxford		4.8	2.5	1.5	.40	.0682	.0729	.26	
328	C. F. Harper, Wilmington		19.7	15.5	14.5	1.40	.0574	.028	.96	
331	W. B. Cooper, Wilmington	Cistern	3.1	3.2	2.2	.20	.0062	.0162	.40	
332	J. L. McDaniel, New Bern		44.3	18.5	17.5	9.15	.0419	.127		
333	E. M. Street, Belair		14.5	12.9	11.9	.60	.025	.0403		
356	D. N. Oliver, Rowland	Artesian well	4.4	2.35	1.35	.25	.088	.0689		
370	T. P. Sale, Raleigh	Pump	11.9	5.90	4.90	2.40	.0908	.0595	3.33	
371	J. A. Wellons, Smithfield		7.01	4.00	3.00	.35	.0762	.0625	3.33	
379	J. Rosenthal, Goldsboro		24.7	8.1	7.1	5.10	.1604	.1267	13.3	
385	D. Clark, Charlotte	Well	8.4	3.0	2.0	1.75	.1304	.1149	6.03	Trace.
386	D. Clark, Charlotte	Village well	3.5	2.2	1.2	.50	.0872	.0965	2.27	
387	D. Clark, Charlotte	Mill well	3.5	2.3	1.3	.45	.0635	.0565	2.12	
413	T. P. Sale, Raleigh	Pump	15.3	5.60	4.60	1.9	.0662	.0915	8.	Some.
415	J. Slocumb, Goldsboro		25.6	6.4	5.4	5.8	.14	.1706	16.	Some.
416	A. S. Harrison, Enfield		3.0	1.8	.8	.6	.07	.07	2.22	
418	A. R. Walton, Randall		1.4	0	0	.2	.0825	.0612		

CHEMICAL ANALYSES OF SUNDRY DRINKING WATERS BY THE STATE CHEMIST—*Continued.*

No.	Name and Address.	Location.	Total Solids.	Hardness.	Calcium Carbonate.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrogen as Nitrates.	Nitrogen as Nitrites.
432	F. Wood, Edenton		16.7	7.5	6.5	4.15	.065	.085	5.71	
435	H. E. Knox, Jr., Charlotte		6.0	3.5	2.5	.70	.1499	.1525	.25	
441	W. F. Massey, Raleigh		5.1	2.8	1.8	.7	.1062	.1061	.225	
442	W. S. Hocoday, Kitchen		6.6	2.55	1.55	.8	.126	.030	.225	
445	R. S. Reinhardt, Lincolnton		35.0	8.8	7.8	7.3	.0475	.0912	20.	
447	Mrs. N. J. Shooter, Red Springs		6.7	1.3	.3	2.4	.0975	.1075	4.82	
451	J. O. Magruder, Winston	Winston water	2.7	1.1	.1	.2	.0475	.075	.2	
456	T. Atwell, Salisbury		15.2	8.3	7.3	.85	.1049	.4849	3.07	4.88
457	J. H. Baker, Jr., Rocky Mount		8.4	2.	1.	2.25	.09	.0975	2.05	
458	J. H. Baker, Jr., Rocky Mount		8.7	3.20	2.20	1.6	.0812	.09	4.	
459	J. H. Baker, Jr., Rocky Mount		10.9	1.9	.9	4.05	.0625	.005	3.67	
460	J. H. Baker, Jr., Rocky Mount		5.5	3.4	2.4	.55	.0575	.065	.7	
461	J. H. Baker, Jr., Rocky Mount		4.7	2.	1.	.4	2.1061	.14	.312	
462	J. H. Baker, Jr., Rocky Mount		13.4	6.3	5.3	2.65	.1501	.1275	4.	
463	J. H. Baker, Jr., Rocky Mount		5.5	4.3	3.3	.45	.0624	.0487	.125	
467	Patterson Textile Co., Roanoke Rapids		4.0	2.55	1.55	.35	.0562	.0717		
470	A. S. Harrison, Enfield		14.3	10.45	9.45	.4	.1717	.0987		
471	W. G. Haywood, Raleigh		25.9	9.3	8.3	4.75	.0512	.11	10.	
473	Delgado Mills, Wilmington		12.	9.2	8.2	.65	.15	.1953		
475	F. R Harris, Henderson	G. A. Rose well	5.80	2.	1.	.7	.052	.039		
476	J. H. McMullan, Edenton		177.4	14.45	13.45	1.25	.25	.1818		
478	J G. McCormick, Maxton		2.6	5.1	4.1	.35	.0541	.0686	2.65	
479	E. B. Bain, Raleigh	Faucet of Raleigh Water Company	4.6	4.40	3.40	.30	.0425	.0637	Trace	
484	J. D. McMillan, Lumberton		3.	1.15	.15	.5	.07	.0724		
485	D. H. Parsons, High Point		19.5	5.25	4.25	6.1	.088	.0739	3.33	
489	T. A. Partin, Raleigh		7.1	6.6	5.6	.3	.055	.1645		
494	Delgado Mills, Wilmington	Stack-house	8.7	6.55	5.55	.65	.0597	.0517		
495	Delgado Mills, Wilmington		12.4	9.	8.	.7	.1175	.1475		
496	Delgado Mills, Wilmington		9.7	6.65	5.65	.45	.0625	.0446		
497	Delgado Mills, Wilmington		6.7	5.3	4.3	.75	.0475	.0650		
498	Delgado Mills, Wilmington		15.1	10.2	9.2	.6	.0695	.085		
499	Delgado Mills, Wilmington		11.1	9.25	8.25	.65	.0442	.0354		
500	Delgado Mills, Wilmington		8.8	7.05	6.05	.55	.0885	.0912		
501	Delgado Mills, Wilmington	Mill yard	9.9	7.9	6.9	.55	.0675	.0589		.023

CHEMICAL ANALYSES OF SUNDRY DRINKING WATERS BY THE STATE CHEMIST—*Continued.*

No.	Name and Address.	Location.	Total Solids.	Hardness.	Calcium Carbonate.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrogen as Nitrates.	Nitrogen as Nitrites.
502	Delgado Mills, Wilmington		52.9	8.55	7.55	.07	.0682	.1618		
503	Delgado Mills, Wilmington		12.6	8 95	7.95	.7	.0799	.0647		
504	Delgado Mills, Wilmington		10.1	7.75	6.75	.7	.0974	.0732		
505	Delgado Mills, Wilmington		15.6	8.1	7.1	.55	.0914	.0562		
506	Delgado Mills, Wilmington		40.7	6.95	5.95	.7	.1002	.0886	Trace	
507	Delgado Mills, Wilmington		13.5	6 95	5.95	.8	.0432	.0620	Trace	
508	Delgado Mills, Wilmington		17.2	10.	9.	.75	.0782	.0471	Trace	
509	Delgado Mills, Wilmington		10.2	7.5	6.5	.5	.0675	.0575	Trace	
510	Delgado Mills, Wilmington		10.5	7.65	6.65	.45	.0228	.0430	Trace	
511	Delgado Mills, Wilmington		7.4	5.5	4.5	.6	.0281	.0357	Trace	
512	Delgado Mills, Wilmington		12.8	8.35	7.35	.55	.0297	.0687	Trace	
513	H. L. Thurston, Southern Pines	Water supply at Southern Pines	1.3	1.1	.1	.25	.0312	.0175	.2	
517	Hyman Supply Company, New Bern	Craven County Poor-house	16.5	10.9	9.9	.65	.071	.17	.182	
520	H. W. Halleman, Enno		4.9	3 55	2.55	.6	.0587	.032	.39	
524	N. B. Dawson, Conetoe		3.9	1 9	.9	.5	.0412	.0536	4.11	
525	Mrs. R. H. Jones, Raleigh		17.8	8.	7.	2.75	.1164	.0612	2.41	
527	Fenner & Wilcox, Halifax		10.6	4.4	3.4	.4	.0425	.0322	.5	
529	W. S. McNair, Maxton		1.4	1.2	.2	.45	.0612	.0702	.0125	
530	Union Copper Mining Company, Goldsboro	Honeycutt spring	2.7	1.75	.75	.4	.0683	.055	.115	
531	Mrs. P. L. Bridgers, Wilmington	Cistern	3.5	3.3	2.3	.3	.1737	.1873	.547	.054
534	D. B. Jordan, Cronly		94.3	3.6	2.6	35.1	1.2817	.3702		
535	D. B. Jordan, Cronly		9.1	5.15	4.15	1.75	.0997	.3756		
536	G. A. Matton, High Point		12.1	5.35	4.35	1.50	.0787	.1567	4.16	.25
537	J. O. Magruder, Winston	Well in tobacco factory	14.7	5.85	4.85	2.35	.0275	.04	8.88	
540	F. B. Higgins, Lynn		3.5	1.05	.05	.35	.0442	.0429	.74	
541	F. B. Higgins, Lynn		4.	2.6	1.6	.2	.061	.0433		
542	F. B. Higgins, Lynn		2.	2.1	1.1	.2	.037	.0291	Trace	
543	F. B. Higgins, Lynn		3.2	2.5	1.5	.3	.0319	.0386		
544	W. R. Weaver, Charlotte		3.6	2.4	1.4	.15	.025	.0339	.392	
548	D. B. Jordan, Cronly		86.1	3.4	2.4	34.9	.678	.0492		
549	D. B. Jordan, Cronly		11.9	5.1	4.1	.95	1.9826	.7786		
551	Mrs. J. T. Holt, Wilson's Mills		2.9	1.05	.05	.75	.0395	.0787	1.	Trace
552	J. H. Webb, Edenton		32.3	7.35	6.35	2.75	.7735	.1362	3.17	.64
553	J. H. Webb, Edenton	Artesian well	5.3	2.25	1.25	.75	.1162	.0864	4.25	

CHEMICAL ANALYSES OF SUNDRY DRINKING WATERS BY THE STATE CHEMIST—*Continued.*

No.	Name and Address.	Location.	Total Solids.	Hardness.	Calcium Carbonate.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Nitrogen as Nitrates.	Nitrogen as Nitrites.
554	N. J. Sherrill, Charlotte		7.9	4.25	3.25	.45	.0374	.0542	.75	Trace
555	J. A. Briggs, Raleigh		19.9	7.5	6.5	3.6	.155	.0511	10.5	Trace
556	W. H. Worth, Raleigh	Well on Dawson street	18.2	5.20	4.2	3.65	.0254	.0381	8.88	Trace
557	W. G. Haywood, Raleigh	Pump on Jones street	11.4	4.55	3.55	2.15	.0302	.0471	6.66	Trace
558	E. K. Proctor, Jr., Lumberton		9.3	6.35	5.35	.37	.0966	.0864		
559	E. K. Proctor, Jr , Lumberton		11.4	7.15	6.15	.35	.037	.0337		
560	E. K. Proctor, Jr., Lumberton		10.2	6.9	5.9	.32	.0357	.0342		
569	H. W. Collins, Wilmington		19.	7.2	6.2	2 1	.0884	.1127	10.	
572	J. W. Townsend, Monroe		11.6	5.3	4.3	1.36	.0382	.0732	Trace	
575	A. W. Shaffer, Raleigh	Municipal water	3.3	1.75	.75	.40	.0812	.1084	.2	
580	J. C. Michie, Durham		3.1	2.05	1.05	.3	.0939	.1214	.307	
587	J. A. Little, Wadesboro	Jno. Gulledge's well	7.3	1.85	.85	1.5	.0977	.0585	5.79	
588	J. A. Little, Wadesboro	Burrel Mills well	17.4	6.65	5.65	2.95	.0604	.0457	11.11	
599	J. H. Webb, Edenton		31.1	8.4	7.4	3.	.5971	.1441	.197	
600	Hyman Supply Company, New Bern	Craven County Poor-house	14.6	10.95	9.95	.70	.2687	.1066	.175	
603	J. T. Albritton, Mt. Olive		3.9	1.35	.35	.6	.0355	.0764	.225	
604	J. A. White, Mooresville		3.0	1.05	.05	.35	.0637	.0924	.462	
607	J. H. Smith, Plymouth	Well	40.	7.85	6.85	10.8	1.021	.0854	.112	.16
609	A. L. Smith, Scotland Neck	Driven well	4.2	1.55	.55	.5	.0694	.0389	1.41	
610	W. M. Cummings, Wilmington		9.2	4.3	3.3	1.2	.0301	.0529	5.13	
612	Raleigh Water Company, Raleigh		2.8	1.55	.55	.3	.0426	.0740	.1975	
614	J. M. Manning, Durham		3.7	1.75	.75	.3	.0476	.131	.27	
615	Jas. McKee, Raleigh		11.3	1.75	.75	2.85	.0572	.0387	3.77	
619	Delgado Mills, Wilmington		10.3	7.25	6.25	.65	.0272	.0649	.26	
620	C. D. Benbow, Pinehurst		2.9	1.	0	.55	.0844	.0519	.425	
630	W. L. McGhee, Franklinton		1.62	6.	5.	3.45	.177	.0716	2.61	.0475
632	R. J. Hooks, Fremont		8.8	5.2	4.2	.45	.1055	.0840		
633	I. T. Turlington, Smithfield		5.1	1.3	.3	.45	.0832	.0684	.307	
634	R. R. Moore, Greensboro		8.5	3.6	2.6	.55	.0755	.0731	.457	
637	W. H. Rand, Raleigh	Well at White Blind Institution	15.3	7.30	6.30	1.55	.1424	.0710	10.79	.2127
645	J. B. Blair, Troy		9.2	6.5	5.5	.25	.0812	.0737	.187	
643	Mrs. W. E. Anderson, Raleigh		65.4	20.25	19.25	24.5	.0642	.1031	13.33	

VITAL STATISTICS.

No material advance, we regret to say, has been made in the collection of vital statistics, notwithstanding earnest efforts on our part to promote the work. Our last attempt consisted in sending to the various boards of aldermen and town commissioners the strongest letter we could write, asking those not reporting to do so and all to adopt the death return and certificate suggested by the Census Department of the General Government, and offering to supply free the necessary blanks, including burial permits bound in books. To make it still easier we sent a copy of a model ordinance, covering the subject, as a guide. We also wrote to every physician resident in the cities and towns, asking them to use their influence with their respective boards to secure the desired object. But the results have been very meagre and discouraging.

In regard to the statistics we have accumulated we must in candor say that we cannot certify to their completeness in every town, although we believe in most cases they are reliable. The interested reader can refer to the tables and draw his own conclusions.

While our statistics, from a general point of view, may not be of any particular interest or value, we think they are both interesting and valuable as bearing on the comparative death rate in the two races, because of their constancy for a number of years. The total annual death rate was for 1899 14.8 per 1,000—white 11.4, colored 18.7—a difference as against the negro race of 7.3; in 1900, white 13.2, colored 20.1, difference 6.9; average difference for the two years 7.1. Inasmuch as deaths among the negroes are more apt to be overlooked than among the whites, it is probable that the above statement is more favorable to the colored race than the actual facts would justify. Unfortunately our record of births is so insignificant that we can form no conclusion as to whether the colored people in our towns are positively diminishing or not.

We give below the comparative figures in consumption, pneumonia, malarial fever and diphtheria.

Consumption.—For 1899, white, death rate 1.11 per 1,000 and 1 in 11 of all deaths; colored, 2.35 and 1 in 8. For 1900, whites, 1.18 and 1 in 11.4; colored, 2.00 and 1 in 10. In 1897 the proportion was 1 white to 3.35 colored; in 1898 1 to 2.4. From these figures it appears that the death rate from consumption among the colored people is, in comparison with that among the whites, diminishing, and as the death rate among the whites is also decidedly less than in the preceding biennial period, consumption is materially less fatal among them.

Pneumonia is one of the diseases most fatal to both races. In 1899 the death rate was, white, 0.86 and 1 in 13.2; colored, 1.40 and 1 in 13.3; 1900, white, 1.18 and 1 in 11; colored, 1.63 and 1 in 12.3.

Malarial fever.—Notwithstanding the accepted opinion that the negro is less susceptible to malarial diseases than the white man the mortuary statistics of our towns persistently show quite the reverse, on the surface at any rate, the proportion being about 3 to 1 in favor of the white race. The figures for 1899 are, white 0.20 and 1 in 55; colored, 0.69, 1 in 27. For 1900, white, 0.33, 1 in 39; colored, 1.02 and 1 in 19.6. As suggested in a former report, the above results are probably not so much attributable to greater susceptibility as to the more malarious conditions prevailing in the outskirts of the towns, where the colored people usually dwell, and the lack of the proper treatment and care incident to their poverty as a class.

Diphtheria.—In the Fifth Biennial Report we called attention to the apparent comparative immunity of the negro to diphtheria, the total number of deaths from this disease in 1893 and 1894 being 22 among the whites, while not one occurred among the colored; in the past two years 19 and 1 respectively. Taking the past eight years, the total number of deaths from diphtheria among the whites was 62 and only 7 among the negroes.

Typhoid fever favors neither race. In the past five years the deaths from this preventable disease were 1 in every 1,717 of the population of the cities and towns reporting. Assuming the rate to have been the same for the whole State, one thousand people die annually in North Carolina from typhoid fever. This should not be, and it is hoped that the enlightened action of the State Board of Agriculture in providing for the free bacteriological examination of drinking water will be the means of reducing these figures. For further particulars the reader is respectfully referred to the following tables:

TABLE I—SHOWING THE COMPARATIVE PREVALENCE OF CERTAIN DISEASES IN THE THREE PHYSICAL DIVISIONS OF THE STATE DURING 1899 AND 1900.

Eastern Division (E)—Alluvial Plain. Central Division (C)—Hilly. Western Division (W)—Mountainous. The figures under the various diseases represent in percentage the proportion of the counties reporting the presence of the disease in question to the whole number of counties sending reports for the month.

			Whole Number Counties.	No. Counties Reporting.	Diphtheria.	Diarrhœal Diseases.	Influenza.	Malarial Fever.	Malarial Fever, Pernicious.	Malarial Fever, Hemorrhagic.	Pneumonia.	Scarlatina.	Typhoid Fever.	Small-pox.
January.	E.	1899	36	27	3.7	0.0	48.1	18.5	0.0	7.4	22.2	3.7	44.4	22.2
		1900		34	2.9	0.0	26.5	11.8	0.0	2.9	26.5	5.9	20.6	26.5
	C.	1899	26	20	15.0	0.0	60.0	0.0	0.0	0.0	35.0	0.0	20.0	0.0
		1900		21	0.0	0.0	19.0	4.8	4.8	0.0	38.1	14.3	28.6	52.4
	W.	1899	34	30	6.7	0.0	46.7	0.0	0.0	0.0	23.3	3.3	23.3	3.3
		1900		31	0.0	3.2	29.0	6.4	3.2	0.0	25.8	3.2	29.0	9.7
February.	E.	1899	36	28	0.0	0.0	42.9	14.3	3.6	10.7	18.0	0.0	21.4	35.7
		1900		31	0.0	0.0	35.5	19.3	6.4	3.2	48.4	3.2	9.7	16.1
	C.	1899	26	22	0.0	0.0	50.0	4.5	0.0	4.5	31.8	0.0	9.1	13.6
		1900		24	0.0	0.0	16.7	4.2	4.2	0.0	25.0	4.2	29.2	66.7
	W.	1899	34	28	7.1	0.0	67.8	3.6	0.0	0.0	39.3	0.0	21.4	3.6
		1900		34	5.9	0.0	26.5	0.0	0.0	0.0	29.4	2.9	29.4	26.5
March.	E.	1899	36	29	0.0	0.0	31.0	13.8	3.4	3.4	10.3	3.4	17.2	58.6
		1900		30	3.3	0.0	56.7	10.0	0.0	6.7	36.7	6.7	20.0	20.0
	C.	1899	26	19	0.0	0.0	42.1	5.3	0.0	0.0	21.0	0.0	5.3	21.0
		1900		25	8.0	0.0	40.0	12.0	0.0	8.0	24.0	4.0	36.0	56.0
	W.	1899	34	28	0.0	0.0	42.9	0.0	0.0	0.0	21.4	3.6	14.3	3.6
		1900		31	3.2	0.0	38.7	0.0	0.0	0.0	19.3	0.0	12.9	29.0
April.	E.	1899	36	26	0.0	7.7	19.2	23.1	3.8	7.7	7.7	3.8	23.1	26.9
		1900		30	3.3	0.0	60.0	3.3	3.3	3.3	20.0	0.0	16.7	13.3
	C.	1899	26	19	5.3	0.0	31.5	10.5	0.0	5.3	5.3	10.5	15.7	26.3
		1900		23	0.0	0.0	36.5	0.0	0.0	0.0	8.7	8.7	37.8	73.9
	W.	1899	34	28	0.0	10.7	21.4	0.0	0.0	0.0	18.0	0.0	25.0	7.1
		1900		31	6.4	0.0	61.3	0.0	0.0	0.0	29.0	3.2	9.7	29.0
May.	E.	1899	36	27	0.0	66.7	0.0	25.9	0.0	7.4	0.0	3.7	40.7	29.6
		1900		32	3.1	46.5	21.9	31.2	3.1	3.1	0.0	3.1	37.5	9.4
	C.	1899	26	22	0.0	54.5	0.0	13.6	0.0	0.0	0.0	0.0	13.6	13.6
		1900		22	0.0	40.9	9.1	18.2	4.5	0.0	0.0	4.5	31.8	63.6
	W.	1899	34	29	0.0	37.9	0.0	3.4	0.0	0.0	0.0	3.4	37.9	13.8
		1900		32	0.0	31.2	18.7	9.4	0.0	0.0	0.0	0.0	18.7	25.0
June.	E.	1899	36	28	0.0	21.4	0.0	42.9	10.7	0.0	0.0	0.0	60.7	18.0
		1900		28	0.0	25.0	7.1	39.3	7.1	3.2	3.2	0.0	35.7	21.4
	C.	1899	26	24	0.0	37.5	0.0	41.7	0.0	0.0	0.0	4.2	70.8	20.8
		1900		21	0.0	28.6	9.5	23.8	0.0	0.0	0.0	4.8	57.1	38.1
	W.	1899	34	30	3.3	30.0	0.0	10.0	6.7	0.0	0.0	0.0	60.0	20.0
		1900		31	0.0	35.5	3.2	12.9	0.0	3.2	0.0	0.0	58.1	16.1
July.	E.	1899	36	24	4.2	16.7	0.0	66.7	4.2	8.3	0.0	0.0	79.2	20.8
		1900		31	0.0	6.4	3.2	64.5	6.2	9.7	0.0	0.0	74.2	16.1

TABLE I—*Continued.*

	•		Whole Number Counties.	No. Counties Reporting.	Diphtheria.	Diarrhœal Diseases.	Influenza.	Malarial Fever.	Malarial Fever, Pernicious.	Malarial Fever, Hemorrhagic.	Pneumonia.	Scarlatina.	Typhoid Fever.	Small-pox.
July.	C.	1899	26	22	9.1	13.6	0.0	50.0	9.1	0.0	0.0	9.1	81.8	13.6
		1900		22	13.6	22.7	4.5	31.8	4.5	4.5	0.0	13.6	54.5	31.8
	W.	1899	34	30	3.3	20.0	3.3	23.3	0.0	0.0	0.0	3.3	63.3	6.7
		1900		29	3.4	20.7	3.4	10.3	0.0	0.0	0.0	3.4	79.3	10.3
August.	E.	1899	36	26	3.8	3.8	0.0	57.7	0.0	19.2	0.0	7.7	76.9	11.5
		1900		30	6.7	3.4	0.0	56.7	3.4	13.3	0.0	6.7	66.7	10.0
	C.	1899	26	23	17.4	8.7	0.0	56.5	8.7	4.3	0.0	4.3	87.0	0.0
		1900		22	13.6	9.1	4.5	36.4	4.5	4.5	0.0	13.3	72.7	27.3
	W.	1899	34	24	4.1	4.1	0.0	20.8	0.0	4.1	0.0	8.3	70.8	0.0
		1900		30	16.7	6.7	0.0	16.7	0.0	0.0	0.0	16.7	73.3	3.4
September.	E.	1899	36	26	7.7	7.7	0.0	73.2	7.7	30.8	0.0	3.8	57.7	7.7
		1900		32	3.1	3.1	0.0	78.1	21.9	15.6	0.0	6.2	53.1	3.1
	C.	1899	26	24	12.5	0.0	4.1	62.5	4.1	0.0	0.0	8.3	70.8	0.0
		1900		21	23.8	0.0	4.8	61.9	4.8	4.8	0.0	9.5	85.7	9.5
	W.	1899	34	28	25.0	3.6	3.6	18.0	0.0	3.6	0.0	7.1	78.6	3.6
		1900		31	25.8	0.0	3.2	9.7	0.0	0.0	3.2	12.9	58.1	9.7
October.	E.	1899	36	27	22.2	0.0	3.7	63.0	14.8	29.6	0.0	7.4	63.0	0.0
		1900		32	9.4	0.0	0.0	84.4	28.1	40.6	0.0	12.5	65.6	3.1
	C.	1899	26	23	13.0	0.0	4.3	52.2	8.7	4.3	0.0	4.3	69.7	13.0
		1900		23	13.0	0.0	8.7	56 5	0.0	8.7	8.7	26.9	78.3	13.0
	W.	1899	34	27	18.5	0.0	3.7	22.2	0.0	0.0	0.0	7.4	70.4	0.0
		1900		30	33.3	0.0	3.3	13 3	0.0	0 0	6.7	20.0	60.0	3.3
November.	E.	1899	36	29	7.0	0.0	10.3	34.5	3.4	10.3	0.0	7.0	62.1	7.0
		1900		32	9.4	0.0	3.1	56.2	3.1	28.1	3.1	15.6	59.4	0.0
	C.	1899	26	23	13.3	0.0	4 3	21.7	4.3	8.7	8.7	13.3	60.9	13.3
		1900		23	17.4	0.0	13.3	39.1	0.0	0.0	0.0	17.4	69.6	17.4
	W.	1899	34	29	17.2	0.0	10.3	10.3	0.0	3.4	3.4	3.4	65.5	7.0
		1900		32	40.6	0.0	6.2	9.4	6.2	0.0	6.2	12.5	56.2	12.5
December.	E.	1899	36	32	3.1	0.0	9.4	21.9	6.2	9.4	21.9	6.2	46.9	18.7
		1900		33	3.0	0.0	15.1	36.4	3 0	21.2	18.2	6.1	57.6	3.0
	C.	1899	26	23	8.7	0.0	17.4	17.4	4.3	0.0	34.8	8.7	39.1	21.7
		1900		23	21.7	0.0	21.7	17.4	4.3	0.0	13.3	13.3	60.9	30.4
	W.	1899	34	29	17.2	0.0	3.4	3.4	0.0	0.0	7.0	10.3	51.7	13.8
		1900		34	23.5	0.0	11.8	0.0	0.0	0.0	17.6	23.5	52.9	8.8
Averages for the Year.	1899	E.	36	27.4	4.3	10.3	13.7	37.9	4.8	12.0	6.7	3.9	49.4	21.4
		C.	26	22.0	7.9	8.8	17.8	28.0	3.3	2.2	11.4	5.2	45.3	13.5
		W.	34	29.0	8.5	9.0	17.0	9.6	0.6	0.9	9.4	4.2	48.5	6.9
	1900	E.	36	33.7	3.7	7.0	19.1	40.7	7.1	12.6	13.2	5.5	43.1	11.8
		C.	26	22.5	9.3	8 4	17.2	25.5	2.6	2.4	9.8	11.2	53.5	40.0
		W.	34	31.3	13.2	8.1	17.1	7.3	0.8	0.3	11.4	8.2	44.8	15.3
	1899	State.	96	78.4	6.9	9.3	16.2	25.2	2.9	5.0	9.2	4.4	47.7	13.9
	1900	State.	96	87.5	8.7	7.8	17.8	24.5	3.5	5.1	11.5	8.3	47.1	22.4

TABLE II—SHOWING THE COMPARATIVE PREVALENCE OF DISEASE DURING THE YEARS 1899 AND 1900.

DISEASES.		NUMBER OF COUNTIES THAT MENTION THE PRESENCE OF EACH DISEASE EACH MONTH.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Number of counties that sent in reports (96 counties in the State)	1899	78	78	76	73	78	82	76	73	78	77	81	84
	1900	85	89	86	81	86	80	82	82	84	85	87	90
Cholera (chicken)	1899	---	---	1	---	2	2	1	---	---	---	---	2
	1900	3	3	1	---	5	2	1	3	1	---	---	---
Cholera (hog)	1899	2	4	3	1	1	2	2	3	1	2	4	3
	1900	2	2	4	1	1	4	4	5	3	5	4	6
Diarrhœal diseases	1899	---	---	---	5	41	24	13	4	2	---	---	---
	1900	1	---	---	---	34	24	13	5	1	---	---	---
Diphtheria	1899	6	2	---	1	1	---	4	6	12	14	10	8
	1900	1	2	4	3	1	---	4	10	14	16	20	14
Distemper (horses)	1899	---	---	---	---	2	1	---	---	---	---	1	---
	1900	---	---	---	2	5	1	4	1	---	---	---	---
Influenza	1899	39	42	30	17	---	1	---	---	2	3	7	8
	1900	22	24	39	51	16	5	2	1	2	3	6	14
Malarial fever	1899	5	6	5	8	11	25	34	33	39	35	19	12
	1900	7	7	6	1	17	20	30	30	41	44	30	16
Malarial fever, hemorrhagic	1899	2	4	1	3	2	---	2	7	9	9	6	3
	1900	1	1	4	1	1	2	4	5	6	15	9	7
Malarial fever, pernicious	1899	---	1	1	1	---	5	3	2	3	6	2	3
	1900	2	3	---	1	2	2	3	2	8	9	3	2
Measles	1899	6	10	11	10	14	7	10	4	2	5	4	12
	1900	33	40	42	39	41	38	26	24	21	19	12	26
Mumps	1899	3	1	3	3	2	2	2	1	1	1	1	1
	1900	5	5	6	9	3	2	2	3	3	1	4	2
Pneumonia	1899	20	22	13	8	---	---	---	---	---	---	3	17
	1900	25	31	23	17	9	1	---	---	1	4	3	15
Rabies (in dogs)	1899	1	---	1	---	---	---	1	---	1	---	---	1
	1900	1	2	2	1	1	---	---	---	---	---	---	---
Rotheln	1899	---	1	1	5	2	---	---	---	---	---	---	---
	1900	---	2	---	2	1	---	---	---	---	---	---	---
Scarlatina	1899	2	---	2	3	2	1	3	5	5	5	6	7
	1900	6	3	3	3	2	1	4	10	8	16	14	13
Small-pox	1899	7	14	20	14	15	16	10	3	3	3	7	15
	1900	23	30	29	30	25	19	15	10	6	5	7	11
Typhoid fever	1899	23	14	10	16	25	52	61	57	54	52	51	39
	1900	19	20	19	16	25	40	58	58	53	57	52	51
Varicella	1899	3	1	---	2	---	---	---	---	---	---	---	---
	1900	3	4	2	3	---	1	---	2	2	---	1	---
Whooping-cough	1899	14	11	9	6	11	14	20	16	11	13	14	12
	1900	17	22	30	23	26	20	23	26	22	20	20	28

TABLE III—Table of Mortality Reports for Year Ending December 31, 1899.

Towns and Reporters.	Races.	Deaths by Months—1899.													Grand Total.	Death-rate (Annual) per 1,000, by Months.												Rate for Year.		Population. (Estimate of Reporters).		Total Population (Census 1900).	Total Death-rate (Census 1900).
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	By Towns.		
Asheville Dr. M. H. Fletcher	W.	3	6	10	7	8	13	8	7	10	4	7	7	90	190	4.5	9.0	15.0	10.5	12.0	19.5	12.0	10.5	15.0	6.0	10.5	10.5	11.2	14.6	8,000	13,000	14,694	12.9
	C.	5	18	11	6	15	8	8	6	10	5	5	3	100		12.0	43.2	26.4	14.4	36.0	19.2	19.2	14.4	24.0	12.0	12.0	7.2	20.0		5,000			
Charlotte Dr. F. O. Hawley.	W.	5	13	12	8	19	22	23	29	28	10	13	5	187	377	3.5	9.3	8.2	5.6	13.3	15.4	16.1	20.3	16.9	6.2	8.1	3.1	9.7	13.0	19,176	29,000	27,752	13.6
	C.	7	21	11	12	14	22	15	22	19	23	10	14	190		9.3	28.0	14.7	16.0	18.7	29.3	20.0	29.0	23.3	28.1	12.2	17.1	19.2		9,824			
Durham Dr. Z. T. Brooks.	W.	7	6	2	3	4	1	7	5	9	3	1	3	51	88	21.0	18.0	6.0	7.5	12.0	3.0	21.0	15.0	27.0	7.5	3.0	9.0	12.7	14.7	4,000	6,000	6,679	13.2
	C.	1	7	4	2	6	6	4	1	1	0	4	1	37		6.0	42.0	24.0	10.0	36.0	36.0	24.0	6.0	6.0	0 0	24.0	6.0	18.5		2,000			
Fayetteville Dr. J. V. McGougan.	W.	5	4	3	2	2	2	4	3	2	2	2	3	34	76	17.1	13.7	10.3	6.8	6.8	6.8	13.7	10.3	6.8	6.8	6.8	10.3	9.7	12.7	3,500	6,000	4,670	16.3
	C.	1	1	4	4	4	2	5	4	6	4	4	3	42		4.8	4.8	19.2	19.2	19.2	9.6	24.0	19.2	28.8	19.2	19.2	14.4	16.8		2,500			
Henderson Dr. W. J. Judd.	W.	0	1	1	2	5	2	2	6	1	3	1	3	27	66	0.0	5.3	5.3	10.7	26.7	10.7	10.7	32.0	5.3	16.0	5.3	16.0	12.0	15.5	2,250	4,250	3,746	17.6
	C.	4	7	5	0	3	4	2	2	5	3	2	2	39		24 0	42.0	30.0	0.0	18.0	24.0	12.0	12.0	30.0	18.0	12.0	12.0	29.5		2,000			
Hillsboro Dr. C. D. Jones.	W.	0	0	0	1	1	1	0	0	2	0	0	2	7	11	0.0	0.0	0.0	30.0	30.0	30.0	0.0	0.0	60.0	30.0	0.0	60.0	17.5	15.7	400	700	707	15.6
	C.	0	0	0	1	0	0	0	1	0	1	1	0	4		0.0	0.0	0.0	40.0	0.0	0.0	0.0	40.0	0.0	0.0	40.0	0.0	13.3		300			
Lenoir Dr. A. A. Kent. Dr. Albert Houck.	W.	1	2	0	0	0	0	1	0	0	1	1	4	10	14	9.6	19.2	0.0	0.0	0.0	0.0	9.6	0.0	0.0	9.6	9.6	38.8	8.0	9.3	1,250	1,500	1,296	10.8
	C.	0	0	0	1	0	2	1	0	0	0	0	0	4		0.0	0.0	0.0	48.0	0.0	96.0	48.0	0.0	0.0	0.0	0.0	0.0	16.0		250			
Marion Dr. B. A. Cheek.	W.	1	1	2	1	3	1	0	1	0	1	0	0	11	16	15.0	15.0	30.0	15.0	45.0	15.0	0.0	15.0	0.0	15.0	0.0	0.0	15.0	13.3	800	1,200	1,116	14.3
	C.	1	0	0	0	0	0	1	3	0	0	0	0	5		30.0	0.0	0.0	0.0	0.0	0.0	30.0	90.0	0.0	0.0	0.0	0.0	12.5		400			
Monroe Dr. J. M. Blair.	W.	1	2	0	1	1	1	2	1	1	2	2	0	14	23	6.7	13.3	0.0	6.7	6.7	6.7	13.3	6.7	6.7	13.3	13.3	0.0	7.8	9.6	1,800	2,400	2,427	9.5
	C.	1	0	1	0	1	2	0	0	2	1	1	0	9		20.0	0.0	20.0	0.0	20.0	40.0	0.0	0.0	40.0	20.0	20.0	0.0	15.0		600			
Oxford Dr. G. A. Coggeshall. Dr. S. H. Cannady.	W.	1	1	0	1	1	1	2	3	1	1	1	1	14	34	10.0	10.0	0.0	10 0	10.0	10.0	20.0	30.0	10.0	10.0	10.0	10.0	11.7	14.8	1,200	2,300	2,059	16.5
	C.	1	1	0	2	4	1	2	1	1	1	3	3	20		10.9	10.9	0.0	21.8	43.6	10.9	21.8	10.9	10.9	10.9	32.7	32.7	18.2		1,100			

TABLE III—*Continued.*

Towns and Reporters.	Races.	Deaths by Months—1899.														Death-rate (Annual) per 1,000, by Months.												Rate for Year.		Population. (Estimate of Reporters).		Total Population (Census 1900).	Total Death-rate (Census 1900)
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	By Towns.		
Raleigh	W.	16	11	2	8	9	13	13	11	12	18	9	2	124	244	22.6	15.5	2.8	11.3	12.7	14.2	14.2	12.0	13.0	19.6	9.8	2.8	11.3	12.2	11,000	20,000	13,643	17.9
T. P. Sale, Clerk B. H.	C.	10	8	11	10	8	16	9	6	9	14	6	13	120		16.3	12.8	17.6	16.0	12.8	21.3	12.0	8.0	12.0	18.4	8.0	17.3	13.3		9,000			
Rocky Mount	W.	2	2	2	2	2	3	4	2	1	4	2	2	28	37	15.0	15.0	15.0	15.0	15.0	22.5	30.0	15.0	7.5	30.0	15.0	15.0	17.5	14.2	1,600	2,600	2,937	12.6
Dr. G. L. Wimberly, Jr.	C.	0	0	0	1	1	2	1	0	2	1	1	0	9		0.0	0.0	0.0	12.0	12.0	24.0	12.0	0.0	24.0	12.0	12.0	0.0	9.0		1,000			
Salem	W.	6	4	3	4	6	5	7	5	2	5	10	4	61	69	17.6	11.7	8.8	11.7	17.6	14.6	20.5	14.6	5.8	14.6	29.3	11.7	15.1	15.2	4,100	4,550	3,642	18.9
S. E. Butner, Mayor.	C.	0	0	2	0	2	1	1	1	0	0	0	1	8		0.0	0.0	53.3	0.0	53.3	26.7	26.7	26.7	0.0	0.0	0.0	26.7	17.8		450			
Salisbury	W.	6	4	1	2	3	6	3	6	5	3	0	5	44	87	18.2	12.0	3.0	6.0	9.0	18.0	9.0	12.0	10.0	6.6	0.0	10.0	7.3	9.7	6,000	9,000	6,277	13.9
Dr. W. W. McKenzie.	C.	6	5	7	0	4	4	3	6	2	3	0	3	43		36.0	30.0	42.0	0.0	24.0	24.0	18.0	24.0	8.0	12.0	0.0	12.0	14.3		3,000			
Scotland Neck	W.	1	0	1	0	1	1	2	0	1	0	1	0	8	13	15.5	0.0	15.5	0.0	15.5	15.5	31.0	0.0	15.5	0.0	15.5	0.0	10.3	10.8	775	1,200	1,348	9.6
J. A. Perry, Mayor.	C.	0	0	0	0	0	2	1	1	1	0	0	0	5		0.0	0.0	0.0	0.0	0.0	56.5	28.2	28.2	28.2	0.0	0.0	0.0	11.8		425			
Tarboro	W.	0	2	1	2	5	2	0	1	3	1	0	1	18	34	0.0	20.0	10.0	18.5	46.1	18.5	0.0	6.0	18.0	6.0	0.0	6.0	9.0	11.3	2,000	3,000	2,499	13.6
Dr. L. L. Staton.	C.	0	2	1	0	0	4	2	1	1	1	1	2	16		0.0	18.5	9.2	0.0	0.0	40.0	20.0	12.0	12.0	12.0	12.0	24.0	16.0		1,000			
Washington	W.	3	4	3	2	2	10	1	5	6	3	2	5	46	129	12.0	16.0	12.0	8.0	6.8	34.3	3.0	17.1	20.6	10.3	6.9	17.1	13.1	21.5	3,500	6,000	4,842	26.6
Dr. P. A. Nicholson.	C.	4	6	6	7	3	12	8	7	9	6	6	9	83		19.2	28.8	28.8	33.6	14.4	57.6	32.0	33.6	23.2	28.8	28.4	43.2	33.2		2,500			
Weldon	W.	0	0	1	0	1	1	0	1	0	0	2	0	6	13	0.0	0.0	17.1	0.0	17.1	17.1	0.0	17.1	0.0	0.0	34.3	0.0	8.6	9.0	700	1,450	1,433	9.1
J. T. Gooch, Mayor.	C.	0	1	1	0	1	1	2	0	0	0	1	0	7		0.0	16.0	16.0	0.0	16.0	16.0	32.0	0.0	0.0	0.0	16.0	0.0	9.3		750			
Wilmington	W.	9	13	12	14	19	22	11	17	13	13	16	16	175	481	10.8	14.2	13.1	15.3	20.7	24.0	11.0	18.5	14.2	13.0	16.0	16.0	14.6	17.8	12,000	27,000	20,976	22.9
Dr. W. D. McMillan.	C.	19	21	26	29	26	32	27	15	24	38	20	29	306		15.2	16.2	20.1	22.4	20.1	24.8	21.6	12.0	18.6	30.4	16.0	23.2	24.0		15,000			
Wilson	W.	2	4	1	0	6	6	3	5	2	3	0	4	36	99	9.6	19.2	4.8	0.0	28.8	28.8	14.4	24.0	9.6	14.4	0.0	19.2	14.4	20.6	2,500	4,800	3,525	28.1
Dr. W. S. Anderson.	C.	7	1	5	2	8	6	4	5	6	5	6	8	63		36.5	5.2	26.1	14.3	41.7	31.3	20.8	26.1	31.3	26.1	31.3	41.8	27.4		2,300			

TABLE No. IV—TABLE OF MORTALITY REPORTS FOR YEAR ENDING DECEMBER 31, 1900.

TOWNS AND REPORTERS.	RACES.	DEATHS BY MONTHS—1900.														DEATH-RATE (ANNUAL) PER 1,000, BY MONTHS.												RATE FOR YEAR.		POPULATION. (ESTIMATE OF REPORTERS).		Total Population (Census 1900).	Total Death-rate (Census 1900).
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	By Towns.		
Asheville	W.	8	5	9	12	15	13	10	12	11	13	11	8	127	232	12.0	7.5	13.5	18.0	22.5	19.5	15.0	18.0	16.5	19.5	16.5	12.0	15.9	17.8	8,000	13,000	14,694	15.8
Dr. C. V. Reynolds.	C.	8	6	4	16	10	3	12	8	8	9	8	13	105		19.2	14.4	9.6	38.4	24.0	7.2	28.8	19.2	19.2	21.6	19 2	31.2	21.0		5,000			
Charlotte	W.	4	10	18	16	18	16	15	14	8	29	15	11	174	370	2.5	6.2	13.3	10.0	13.3	10.0	9.4	8.8	5.0	18.1	9.3	6.8	9.2	12.7	19,176	29,000	27,752	13.3
Dr. F. O. Hawley.	C.	13	15	18	15	17	17	14	13	20	21	18	15	196		16.2	18.4	22.1	18.4	28.9	20.8	17.1	15.9	24.6	25.9	22.1	18.3	19.9		9,824			
Durham	W.	8	6	14	8	3	5	9	1	9	8	6	5	82	110	24.0	18.0	42.0	24.0	9.0	15.0	27.0	3.0	27.0	24 0	18.0	15.0	20.5	18.3	4,000	6,000	6,679	16.5
Dr. Z. T. Brooks.	C.	1	2	4	2	2	3	2	3	4	2	1	2	28		6.0	12.0	24.0	12.0	12.0	18.9	12.0	18.0	24.0	12.0	6.0	12.0	14.0		2,000			
Goldsboro	W.	3	1	3	2	3	4	5	2	6	3	2	4	38	105	7.2	2.4	7.2	4.8	7.2	9.6	12 0	4.8	14.4	7.2	4.8	9.6	8.4	15.0	4,500	8,000	5,877	17.8
J. E. Peterson, Mayor.	C.	3	6	4	7	9	13	5	4	5	3	6	2	67		12.0	24.0	16.0	28.0	36.0	52.0	20.0	16.0	20.0	12.0	24.0	8.0	26.8		2,500			
Henderson	W.	1	1	3	5	1	6	4	2	0	1	1	2	27	53	5.3	5.3	16.0	26.7	5.3	32.0	21.3	10.7	0.0	5.3	5.3	10.7	12.0	12 5	2,250	4,250	3,746	14.4
Dr. F. R. Harris.	C.	3	4	1	1	0	1	4	4	0	5	1	2	26		18.0	24.0	6.0	6.0	0.0	6.0	24.0	24.0	0.0	30.0	6.0	12.0	13.0		2,000			
Hillsboro	W.	1	0	0	1	0	2	0	1	0	0	0	0	5	10	30.0	0.0	0.0	30.0	0.0	60.0	0.0	30.0	0.0	0 0	0.0	0.0	12.5	14.3	400	700	707	14.1
Dr. C. D. Jones.	C.	0	0	0	1	1	0	2	0	0	0	1	0	5		0.0	0.0	0.0	40.0	40.0	0.0	80.0	0.0	0.0	0.0	40.0	0.0	16.7		300			
Lenoir	W.	0	1	0	1	1	0	1	0	1	0	1	0	6	10	0.0	9.6	0.0	9.6	10.0	0.0	10.0	0.0	13.3	0.0	13.3	0.0	6.7	8.3	900	1,200	1,296	7.7
Dr. A. A. Kent.	C.	0	0	1	0	2	1	0	0	0	0	0	0	4		0.0	0.0	48.0	0.0	60.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3		300			
Marion	W.	0	2	0	0	0	0	1	3	1	1	2	1	11	17	0.0	30.0	0.0	0.0	0.0	0.0	15.0	45.0	15.0	15.0	30.0	15.0	13.7	14.2	800	1,200	1,116	15.2
Dr. B. A. Cheek.	C.	0	0	0	1	1	1	1	2	0	0	0	0	6		0.0	0.0	0 0	30.0	30.0	30.0	30.0	60.0	0.0	0.0	0.0	0.0	15.0		400			
Monroe	W.	0	0	0	0	1	1	2	3	0	2	1	2	12	18	0.0	0.0	0.0	0.0	6.7	6.7	13.3	20.0	0 0	13.3	6.7	13.3	6.7	7.5	1,800	2,400	2,427	7.4
Dr. J. M. Blair.	C.	0	1	2	0	1	0	0	0	1	1	0	0	6		0.0	20.0	40.0	0.0	20.0	0.0	0.0	0.0	20.0	20.0	0.0	0.0	10.0		600			
Oxford	W.	2	0	0	2	0	0	1	3	4	2	0	0	14	34	20.0	0.0	0.0	20.0	0.0	0.0	10.0	30.0	40.0	20.0	0.0	0.0	11.7	13.0	1,200	2,300	2,059	16.5
Dr. S. D. Booth.	C.	0	2	2	1	1	1	2	4	1	3	0	3	20		0.0	21.8	21.8	10.9	10.9	10.9	21.8	43.6	10.9	32.8	0.0	32.7	18.1		1,100			
Raleigh	W.	10	6	11	8	11	12	18	15	12	18	10	9	140	307	10.9	6.5	12 0	8.7	12.0	13.1	19.6	16.4	13.1	19.6	10.9	9.8	11.7	15.3	11,000	20,000	13.643	22.5
T. P. Sale, Clerk B. H.	C.	13	11	9	14	14	16	24	18	14	16	10	8	167		17.3	14.7	12.0	18.7	18.7	21.3	32.0	24.0	18.7	21.3	13.3	10.7	18.3		9,000			

TABLE IV—*Continued.*

Towns and Reporters.	Races.	Deaths by Months—1900.														Death-rate (Annual) per 1,000, by Months.												Rate for Year.		Population. (Estimate of Reporters).		Total Population (Census 1900).	Total Death-rate (Census 1900).
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	By Towns.		
Rockingham	W.	0	1	2	1	1	0	1	5	1	1	5	1	19	27	0.0	8.0	16.0	8.0	8.0	0.0	8.0	40.0	8.0	8.0	40.0	8.0	12.7	13.5	1,500	2,000	1,507	17.9
Dr. J. M. Covington.	C.	3	1	0	1	0	0	0	0	0	1	0	2	8		72.0	24.0	0.0	24.0	0.0	0.0	0.0	0.0	0.0	24.0	0.0	48.0	16.0		500			
Rocky Mount	W.	2	4	2	1	0	1	0	2	3	2	4	0	21	34	15.0	30.0	15.0	7.5	0.0	7.5	0.0	15.0	22.5	15.0	30.0	0.0	13.1	13.1	1,600	2,600	2,937	11.6
Dr. G. L. Wimberly, Jr.	C.	2	0	0	0	1	2	1	1	0	0	6	0	13		24.0	0.0	0.0	0.0	12.0	24.0	12.0	12.0	0.0	0.0	72.0	0.0	13.0		1,000			
Salem	W.	5	6	9	7	7	6	3	3	4	5	3	3	61	73	14.6	17.6	26.3	20.5	20.5	17.8	8.8	8.8	11.7	14.6	8.8	8.8	15.0	16.0	4,100	4,550	3,642	19.8
S. E. Butner, Mayor.	C.	1	1	4	1	1	2	0	0	1	1	0	0	12		26.7	26.7	106.7	26.7	26.7	53.3	0.0	0.0	26.7	26.7	0.0	0.0	26.7		450			
Salisbury	W.	9	3	6	6	3	3	6	5	3	5	3	3	55	111	18.0	6.0	12.0	12.0	6.0	6.0	12.0	10.0	6.0	10.0	6.0	6.0	9.2	12.3	6,000	9,000	6,277	17.7
Dr. W. W. McKenzie.	C.	8	5	4	6	8	2	6	5	4	3	3	2	56		32.0	20.0	16.0	24.0	32.0	8.0	24.0	20.0	16.0	12.0	12.0	8.0	18.7		3,000			
Scotland Neck	W.	1	0	1	1	0	2	1	3	2	1	0	0	12	19	15.5	0.0	15.5	15.5	0.0	31.0	15.5	46.4	31.0	15.5	0.0	0.0	15.5	15.8	775	1,200	1,348	14.1
Dr. J. P. Wimberley.	C.	0	1	1	0	0	1	1	0	0	0	2	1	7		0.0	28.3	28.3	0.0	0.0	28.3	28.3	0.0	0.0	0.0	48.0	24.0	16.5		425			
Tarboro	W.	0	1	0	1	1	0	1	1	1	1	0	2	9	15	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	6.0	6.0	0.0	12.0	4.5	6.0	2,000	2,500	2,499	6.0
Dr. L. L. Staton.	C.	0	1	1	1	0	1	0	2	0	0	0	0	6		0.0	12.0	12.0	12.0	0.0	12.0	0.0	24.0	0.0	0.0	0.0	0.0	10.0		500			
Washington	W.	4	4	3	1	2	3	5	2	6	4	5	2	41	80	13.8	13.8	10.3	3.4	6.8	10.3	17.1	6.9	20.6	13.7	17.1	6.8	11.7	13.3	3,500	6,000	4,842	16.3
Dr. John G. Blount.	C.	2	4	5	4	4	3	2	3	0	4	2	6	39		9.6	19.2	24.0	19.2	19.2	14.4	9.6	14.4	0.0	19.2	9.6	28.8	15.6		2,500			
Weldon	W.	0	1	0	0	2	2	0	1	0	0	1	0	7	22	0.0	17.1	0.0	0.0	34.3	34.3	0.0	17.1	0.0	0.0	17.1	0.0	10.0	15.1	700	1,450	1,433	15.3
J. T. Gooch, Mayor.	C.	2	2	2	2	0	2	2	0	1	2	0	0	15		32.0	32.0	32.0	32.0	0.0	32.0	32.0	0.0	16.0	32.0	0.0	0.0	20.0		750			
Wilmington	W.	15	10	12	13	16	26	27	20	28	37	25	19	256	616	15.0	10.0	20.0	13.0	16.0	26.3	27.0	18.3	28.0	37.0	25.0	19.0	21.3	22.8	12,000	27,000	20,976	29.4
Dr. Charles T. Harper.	C.	21	27	23	22	39	18	37	31	49	29	31	33	360		16.8	21.6	18.4	17.6	31.2	14.4	29.6	24.8	39.2	33.2	24.8	26.4	24.0		15,000			
Wilson	W.	4	6	5	5	7	6	2	2	6	9	2	2	56	128	19.2	28.8	24.0	24.0	33.6	28.8	9.6	9.6	28.8	43.2	9.6	9.6	22.4	26.6	2,500	4,800	3,525	36.3
Dr. W. S. Anderson.	C.	0	3	6	6	6	11	4	6	9	10	6	5	72		0.0	15.6	31.3	31.3	31.3	57.4	20.9	15.6	39.2	52.2	15.6	26.1	31.3		2,300			

TABLE V—SHOWING CAUSES OF DEATH FOR YEAR ENDING DECEMBER 31, 1899.

TOWNS.	RACES.	POPULATION. (ESTIMATE OF REPORTERS).		ANNUAL DEATH-RATE PER 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	TOTAL DEATHS.		Deaths Under Five Years.	Still-born.	Total Population (Census 1900).	Total Death-rate (Census 1900).
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.				
Asheville	White.	8,000	13,000	11.2	14.6	1	1	0	1	1	0	7	4	11	4	4	13	41	2	0	0	90	190	30	12	14,694	12.9
	Colored.	5,000		20.0		0	0	0	0	0	0	5	17	7	7	4	14	43	3	0	0	100		40	18		
Charlotte	White.	19,176	29,000	9.7	13.0	10	0	0	0	2	0	9	21	4	9	0	26	101	5	0	0	187	377	94	25	27,752	13.6
	Colored.	9,824		19.2		8	0	3	0	0	0	15	16	2	7	1	22	109	7	0	0	190		68	18		
Durham	White.	4,000	6,000	12.7	14.7	0	0	4	1	0	0	8	4	1	1	1	5	25	1	0	0	51	88	12	3	6,679	13.2
	Colored.	2,000		18.5		3	0	3	0	0	0	7	6	0	1	0	0	14	3	0	0	37		10	2		
Fayetteville	White.	3,500	6,000	9.7	12.7	0	0	2	0	0	0	0	5	2	11	2	0	12	0	0	0	34	76	6	1	4,670	16.3
	Colored.	2,500		16.8		0	0	0	0	1	0	0	9	0	6	1	6	17	2	0	0	42		15	2		
Henderson	White.	2,250	4,250	12.0	15.5	3	0	0	0	0	0	1	5	4	5	0	6	3	0	0	0	27	66	8	0	3,746	17.6
	Colored.	2,000		29.5		1	0	0	1	0	0	3	11	1	0	0	5	16	1	0	0	39		17	6		
Hillsboro	White.	400	700	17.5	15.7	0	0	0	0	0	0	1	0	0	0	0	2	3	1	0	0	7	11	1	0	707	15.6
	Colored.	300		13.3		0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	4		0	0		
Lenoir	White.	1,250	1,500	8.0	9.3	0	0	0	0	0	0	1	0	1	3	0	0	3	2	0	0	10	14	2	2	1,296	10.8
	Colored.	250		16.0		1	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	4		0	0		
Marion	White.	800	1,200	15.0	13.3	2	0	0	0	0	0	0	0	4	0	1	0	3	0	1	0	11	16	3	0	1,116	14.3
	Colored.	400		12.5		3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	5		0	0		
Monroe	White.	1,800	2,400	7.8	9.6	2	0	0	4	0	0	0	4	0	2	0	0	2	0	0	0	14	23	0	0	2,427	9.5
	Colored.	600		15.0		0	0	3	0	0	0	0	1	0	0	0	0	5	0	0	0	9		0	0		

TABLE V—*Continued.*

Towns.	Races.	Population. (Estimate of Reporters).		Annual Death-rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths Under Five Years.	Still-born.	Total Population (Census 1900).	Total Death-rate (Census 1900).
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.				
Oxford	White.	1,200	2,300	11.7	14.8	2	0	0	0	0	0	0	0	5	3	1	1	1	1	0	0	14	34	1	2	2,059	16.5
	Colored.	1,100		18.2		0	0	0	0	0	0	2	2	1	1	0	2	11	1	0	0	20		5	2		
Raleigh	White.	11,000	20,000	11.3	12.2	3	0	0	1	1	0	12	17	11	8	0	18	53	0	0	0	124	244	43	4	13,643	17.9
	Colored.	9,000		13.3		1	0	1	0	0	0	11	16	7	8	1	11	60	3	0	1	120		44	21		
Rocky Mount	White.	1,600	2,600	17.5	14.2	2	0	2	1	0	0	2	2	3	2	1	6	7	0	0	0	28	37	6	2	2,937	12.6
	Colored.	1,000		9.0		0	0	0	0	0	0	2	1	0	0	1	2	3	0	0	0	9		2	0		
Salem	White.	4,100	4,550	15.1	15.2	2	0	1	0	0	0	6	8	0	3	0	1	40	0	0	0	61	69	22	9	3,642	18.9
	Colored.	450		17.8		0	0	0	0	0	0	1	2	0	0	0	0	5	0	0	0	8		1	3		
Salisbury	White.	6,000	9,000	7.3	9.7	1	0	0	1	0	0	3	5	6	4	0	8	14	2	0	0	44	87	15	0	6,277	13.9
	Colored.	3,000		14.3		1	0	0	0	0	0	8	9	1	5	1	11	6	1	0	0	43		17	4		
Scotland Neck,	White.	775	1,200	10.3	10.8	1	0	0	0	0	0	2	1	1	0	0	3	0	0	0	0	8	13	2	0	1,348	9.6
	Colored.	425		11.8		0	0	0	0	2	0	0	0	0	1	0	0	1	1	0	0	5		3	0		
Tarboro	White.	2,000	3,000	9.0	11.3	1	0	0	0	2	1	3	0	0	2	0	0	9	0	0	0	18	34	0	1	2,499	13.6
	Colored.	1,000		16.0		0	0	0	0	0	0	1	2	0	2	0	2	9	0	0	0	16		0	0		
Washington	White.	3,500	6,000	13.1	21.5	1	0	0	0	0	0	8	4	7	3	0	5	18	0	0	0	46	129	16	0	4,842	26.6
	Colored.	2,500		33.2		2	0	9	0	2	0	4	12	7	3	0	11	32	1	0	0	83		19	0		
Weldon	White.	700	1,450	8.6	9.0	0	0	1	0	0	0	1	0	0	0	0	0	4	0	0	0	6	13	1	0	1,433	9.1
	Colored.	750		9.3		0	0	1	0	0	0	1	0	0	0	0	0	5	0	0	0	7		2	3		
Wilmington	White.	12,000	27,000	14.6	17.8	3	0	4	4	0	0	6	8	5	4	3	0	131	6	1	0	175	481	50	19	20,976	22.9
	Colored.	15,000		24.0		5	0	17	0	0	0	17	24	4	4	1	11	214	9	0	0	306		76	48		

TABLE V—*Continued.*

TOWNS.	RACES.	POPULATION. (ESTIMATE OF REPORTERS).		ANNUAL DEATH-RATE PER 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	TOTAL DEATHS.		Deaths Under Five Years.	Still-born.	Total Population (Census 1900).	Total Death-rate (Census 1900).
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.				
Wilson	White.	2,500	4,800	14.4	20.6	3	0	4	0	0	1	5	2	3	2	0	2	13	0	0	1	36	99	15	0	3,525	28.1
	Colored.	2,300		27.4		1	0	3	0	0	0	6	10	1	4	1	0	35	2	0	0	63		23	1		
Total 20 towns	White.	86,551	145,950	11.4	14.8	37	1	18	13	6	2	75	90	68	66	13	96	483	20	2	1	991	2101	327	80	126,268	16.6
	Colored.	59,399		18.7		26	0	41	1	5	0	83	140	31	49	12	98	589	34	0	1	1110		342	128		
Grand total	------------	145,950	--------	------	------	63	1	59	14	11	2	158	230	99	115	25	194	1072	54	2	2	2101	----	----	----	--------	----

TABLE VI—Showing Causes of Death for Year Ending December 31, 1900.

Towns.	Races.	Population. (Estimate of Reporters).		Annual Death-rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths Under Five Years.	Still-born.	Total Population (Census 1900).	Total Death-rate (Census 1900).
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.				
Asheville	White.	8,000	13,000	15.9	17.8	7	0	0	0	5	2	13	4	8	8	2	13	58	7	0	0	127	232	34	8	14,694	15.8
	Colored.	5,000		21.0		2	0	1	0	1	0	15	8	6	5	2	12	49	3	1	0	105		16	13		
Charlotte	White.	19,176	29,000	9.2	12.7	6	1	2	3	1	6	11	5	2	8	0	12	114	3	0	0	174	370	81	17	27,752	13.3
	Colored.	9,824		19.9		5	0	3	0	0	0	20	16	2	7	1	13	121	8	0	0	196		71	9		
Durham	White.	4,000	6,000	20.5	18.3	5	0	2	1	0	1	15	14	2	6	0	5	29	2	0	0	82	110	22	0	6,679	16.5
	Colored.	2,000		14.0		3	0	1	0	0	0	3	4	0	1	0	4	12	0	0	0	28		5	0		
Goldsboro	White.	4,500	8,000	8.4	15.0	1	0	3	0	0	1	3	1	0	6	1	10	9	2	1	0	38	105	9	0	5,877	17.8
	Colored.	3,500		26.8		1	0	3	0	0	0	5	14	0	2	1	13	27	0	0	1	67		16	0		
Henderson	White.	2,250	4,250	12.0	12 5	1	0	0	0	0	0	1	2	3	1	2	9	8	0	0	0	27	53	5	2	3,746	14.4
	Colored.	2,000		13.0		2	0	0	0	0	1	1	1	1	0	2	2	16	0	0	0	26		12	3		
Hillsboro	White.	400	700	12.5	14.3	0	0	0	0	0	0	0	0	1	0	1	1	2	0	0	0	5	10	1	0	707	14.1
	Colored.	300		16.7		1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5		0	0		
Lenoir	White.	900	1,200	6.7	8.3	2	0	0	0	0	0	2	1	0	0	1	0	0	0	0	0	6	10	1	1	1,296	7.7
	Colored.	300		13.3		0	0	0	0	0	0	1	0	0	2	0	0	1	0	0	0	4		1	0		
Marion	White.	800	1,200	13.7	14.2	4	0	0	0	0	0	0	0	0	0	4	0	2	0	1	0	11	17	0	1	1,116	15.2
	Colored.	400		15.0		2	0	0	0	0	0	1	0	0	0	0	1	2	0	0	0	6		0	2		
Monroe	White.	1,800	2,400	6.7	7.5	0	0	0	0	0	0	1	0	1	2	0	2	6	0	0	0	12	18	0	0	2,427	7.4
	Colored.	600		10.0		1	0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	6		0	0		
Oxford	White.	1,200	2,300	11.7	13.0	0	0	0	0	0	0	0	1	3	0	0	2	8	0	0	0	14	34	5	1	2,059	16.5
	Colored.	1,100		18.1		0	0	0	0	0	1	0	1	0	2	0	0	13	2	0	1	20		10	2		

TABLE VI—*Continued*.

Towns.	Races.	Population. (Estimate of Reporters).		Annual Death-rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths Under Five Years.	Still-born.	Total Population (Census 1900).	Total Death-rate (Census 1900).
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.				
Raleigh	White.	11,000	20,000	11.7	15.3	8	0	1	0	2	1	9	13	15	11	0	15	63	2	0	0	140	307	45	6	13.643	22.5
	Colored.	9,000		18.3		2	0	1	0	2	0	7	15	5	1	4	17	110	2	0	1	167		68	21		
Rockingham	White.	1,500	2,000	12.7	13.5	1	0	0	0	1	0	3	4	1	1	0	3	4	1	0	0	19	27	----	----	1,507	17.9
	Colored.	500		16.0		0	0	0	0	0	1	3	0	1	0	0	0	1	1	0	1	8		----	----		
Rocky Mount	White.	1,600	2,600	13.1	13.1	3	0	0	0	0	0	3	0	2	4	0	1	7	1	0	0	21	34	6	0	2,937	11.6
	Colored.	1,000		13.0		1	0	0	0	0	0	0	4	0	0	0	2	6	0	0	0	13		0	0		
Salem	White.	4,100	4,550	15.0	16.0	1	0	0	0	0	0	10	7	0	2	0	6	34	1	0	0	61	73	20	6	3,642	19.8
	Colored.	450		26.7		0	0	0	0	0	1	5	1	0	0	0	2	3	0	0	0	12		5	1		
Salisbury	White.	6,000	9,000	9.2	12.3	5	0	0	1	0	0	4	8	3	4	1	3	22	4	0	0	55	111	15	4	6,277	17.7
	Colored.	3,000		18.7		5	0	0	0	0	0	8	9	1	7	0	7	19	0	0	0	56		13	0		
Scotland Neck	White.	775	1,200	15.5	15.8	1	0	2	0	0	1	2	1	0	0	0	2	3	0	0	0	12	19	3	0	1,348	14.1
	Colored.	425		16.5		0	0	1	0	0	0	2	1	0	0	0	1	2	0	0	0	7		2	0		
Tarboro	White.	2,000	2,500	4.5	6.0	0	0	0	0	0	0	1	1	0	1	0	3	1	2	0	0	9	15	1	0	2,499	6.0
	Colored.	500		10.0		0	0	0	0	0	0	0	0	0	1	1	0	3	1	0	0	6		0	0		
Washington	White.	3,500	6,000	11.7	13.3	2	0	0	1	0	0	1	5	6	3	0	8	14	1	0	0	41	80	2	1	4,842	16.3
	Colored.	2,500		15.6		3	0	2	0	0	0	1	9	4	3	0	7	10	0	0	0	39		0	1		
Weldon	White.	700	1,450	10.0	15.1	0	0	1	0	0	0	2	0	0	0	0	1	3	0	0	0	7	22	2	0	1,433	15.3
	Colored.	750		20.0		0	0	0	0	2	0	2	1	0	1	0	0	9	0	0	0	15		3	0		
Wilmington	White.	12,000	27,000	21.3	22.8	7	1	19	0	0	1	17	29	10	8	11	37	110	6	0	0	256	616	90	19	20,976	29.4
	Colored.	15,000		24.0		5	0	41	0	0	0	22	26	11	9	18	34	183	11	0	0	360		142	49		

TABLE VI—*Continued.*

Towns.	Races.	Population. (Estimate of Reporters).		Annual Death-rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths Under Five Years.	Still-born.	Total Population (Census 1900).	Total Death-rate (Census 1900).
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.				
Wilson	White.	2,500	4,800	22.4	26.6	2	0	0	0	1	0	8	7	2	2	2	5	26	1	0	0	56	128	16	1	3,525	36.3
	Colored.	2,300		31.3		0	0	9	0	4	0	3	8	0	1	1	6	38	1	0	1	72		22	0		
Total 21 towns	White.	88,701	149,150	13.2	16.0	56	2	30	6	10	13	106	103	59	67	25	138	523	33	2	0	1173	2391	355	67	128,982	18.5
	Colored.	60,449		20.1		33	0	62	0	9	4	99	121	31	42	30	121	631	29	1	5	1218		386	101		
Grand total	----------	149,150	------	------	------	89	2	92	6	19	17	205	224	90	109	55	259	1154	62	3	5	2391	----	741	168	--------	----

SMALL-POX.

Small-pox has been very prevalent in the State during the past two years and increasingly so to a very marked degree. According to the tabulated statements of the disease made for the annual meetings of the Board in May the number of cases and deaths from the first case, which occurred in Wilmington on January 12, 1898, to May 1, 1899, was 616 in 38 counties; 162 white and 554 colored, with 8 and 9 deaths or 4.93 per cent. and 1.97 per cent. respectively, the average death rate for both races being 2.76 per cent. For the twelve months from May 1, 1899, to May 1, 1900, the total number of cases was 2,806 in 55 counties, 731 white and 2,075 colored, total number of deaths 65, 35 white and 30 colored, or 4.78 per cent. and 1.44 per cent. respectively, the average death rate for both races 2.31 per cent. Subtracting the total number of cases occurring in the calendar year 1898, which was 137, and adding the number of cases occurring since May 1, 1900, to January 1, 1901, which was 732, it appears that the grand total of cases occurring in the two years covered by this report was 3,017.*

The management of the disease, from the preventive point of view, has been quite difficult, owing to its mildness, to the prejudice of the people against vaccination and to the inexperience of our physicians in the matter of small-pox. But for the enlightened action of his Excellency the Governor in authorizing the expenditure of so much of the emergency fund appropriated for the suppression of epidemics of pestilential disease, in section 29 of the Act in Relation to the Board of Health, as might be necessary for the employment of small-pox experts, the record would have been very much worse. By settling the diagnosis in doubtful cases and by giving specific instructions to county superintendents of health and to county and municipal authorities, very many outbreaks were stopped far short of what they otherwise would have been. The State never received a greater return from the expenditure of the same amount of money. The difficulties of the situation were increased by the fact that eleven counties had no superintendent of health. Some official vested with authority is manifestly necessary in the proper management of epidemics of contagious disease, and the only official so endowed by the law is the county superintendent of health. Inasmuch as the county commissioners included in the above number had not responded to repeated appeals from the Secretary, the Board felt that the public interests demanded the correction of this omission and the action set forth in the following correspondence was taken:

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*The details as to counties can be found in the tables given in the two annual reports of the Secretary to the Conjoint Session with the State Medical Society.

RALEIGH, June 8, 1899.

HON. Z. V. WALSER,
Attorney-General.

DEAR SIR:—At the recent annual meeting of the State Board of Health at Asheville I was instructed to obtain your opinion as to the proper course to be pursued to secure the performance by county commissioners of the duty laid upon them in section 5 of chapter 214, Laws of 1893, viz.: the election of a county superintendent of health.

In view of the prevalence of small-pox in the State at present and the still greater prevalence probable next winter, and of the fact that the county superintendent of health is the only official empowered by law to take charge of outbreaks of contagious disease, it is unnecessary to say that the interests of the people require such an official in every county. There are eleven counties without a superintendent.

An early reply would oblige,

Yours very truly,
RICHARD H. LEWIS, M. D.,
Secretary.

STATE OF NORTH CAROLINA, EXECUTIVE DEPARTMENT.

OFFICE OF ATTORNEY-GENERAL.

LEXINGTON, N. C., June 10, 1899.

DR. RICHARD H. LEWIS,
Secretary State Board of Health, Raleigh, N. C.

DEAR SIR:—In reply to your letter of recent date, I will say that section 711 of The Code makes it a misdemeanor for a county commissioner to neglect to perform any duty required of him by law and subjects him to a penalty of $200 for each offense. I have no doubt that if you will call the attention of the county commissioners to the duty imposed upon them by section 5, chapter 214, Acts 1893, of electing a county superintendent of health, that they will comply promptly therewith.

Very respectfully,
ZEB. V. WALSER,
Attorney-General.

Again at the meeting of the Board at the time of the Health Conference at Wilson, November 1, 1899, another effort was made, the details of which can be gathered from this letter, which was sent to every county commissioner in the State:

RALEIGH, November 25, 1899.

DEAR SIR:—At a meeting of the State Board of Health at Wilson, on the 1st inst., the small-pox situation in relation to our State was canvassed. The unanimous conclusion reached was that the outlook for the coming winter is very threatening. This opinion was based upon the fact that during the past winter and spring the disease had been very prevalent in our own State, more than six hundred cases from May 1, 1898, to May 1, 1899, and still more extensively in the adjoining States of South Carolina and Virginia, particularly in Norfolk and vicinity, and especially upon the further fact that in Virginia and in one or two of our own northeastern counties, for a long while after the beginning of the epidemic, practically no effort was made to control its spread, and no disinfection of the houses and effects of small-pox cases was practised. The germs, therefore, are still present in numberless places—hundreds it would be safe to say—and small-pox being a cold weather disease, chiefly, we have good reason to expect a renewal of the epidemic this winter on a still larger scale, unless the proper precautions are promptly taken. As confirming the above, I will say that in several outbreaks in our State since the cool weather set in this fall the disease has been traced in nearly every instance to Norfolk or vicinity.

In view of the conditions stated the following action was taken by the Board: "On motion, the Secretary was instructed to write to all the county commissioners in the State individually, urging upon those in counties having no superintendent of health the pressing necessity for the election of such official, as required by the law of the State (section 5, chapter 214, Laws 1893), and upon all the great importance of making preparation for probable outbreaks of small-pox, and recommending for vaccination glycerinized points."

The first and most essential part of this preparation is a realizing sense of their responsibility in the premises on the part of county and municipal authorities. If this state of mind exists the actual preparations will surely and promptly be made.

There is only one certain way of preventing the introduction and spread of small-pox, and that is by the thorough vaccination of *all* the people, for quarantines are notoriously ineffective, while they are expensive and annoying. Vaccination should be encouraged whether small-pox is immediately at hand or not, but upon the occurrence of a case in a county, general vaccination, certainly in that neighborhood at least, should be ordered and rigidly enforced. The best method of securing this—assuming a sufficient amount of "back-bone" on the part of the commissioners, which is a *sine qua non*—is for the county to furnish the virus and arrange with the physicians who can be counted on to do the work for little or nothing, and make it free to all. Ample powers to provide for and enforce vaccination are conferred upon boards of commissioners by section 23 of the act cited above. For your convenience, I enclose copies of those sections bearing upon small-pox and bespeak from you a careful reading of the same. I will also send you a copy of our BULLETIN for the present month, which is now in press, and I commend to you the valuable article on "Vaccination as an Economic Measure" by Dr. Dodson. It will well repay reading.

When small-pox has actually made its appearance in a county, much the best, and in the end the cheapest, way to manage and control it is to have all cases immediately transferred to a small-pox hospital or pest-house, and to have all persons who have been exposed vaccinated at once and quarantined or detained in suitable quarters until sufficient time has elapsed to prove that they have not contracted the disease. In our climate the hospital and the detention quarters may be cheap cabins or floored tents, with stoves. Preparation on this line would consist in making inquiries *now* as to the availability and price of lumber and tents, so as to be able to decide on a moment's notice which you would prefer in case of emergency, and where they could be obtained. As you have no doubt observed through life, it is the man who is *ready* that "gets there" in every line of work.

Under the law (see section 9) the superintendent of health must see that all cases of the contagious diseases mentioned are properly quarantined and that thorough disinfection is practiced, but it is not made his duty to *treat* these cases—small-pox—any more than diphtheria or scarlet fever. As a matter of fact, however, the superintendent does treat them, and inasmuch as attendance thereon is sure to wreck his private practice and largely deprive him for the time being of his usual means of livelihood, I hope you will pardon me if I suggest that when he is required to do this work he should receive such extra compensation as would be fair and right.

Hoping that you will give the subject matter of this letter your serious consideration, I am,

Very respectfully yours,

RICHARD H. LEWIS,
Secretary.

With the exception of Camden and Tyrrell every county responded and there is now a legal health officer for every county except those two and the new county of Scotland, which has been organized since.

EXTRACTS FROM THE ACT IN RELATION TO THE BOARD OF HEALTH, CHAPTER 214, LAWS 1793, BEARING ON SMALL-POX.

As amended by the Legislature of 1897, the following is the correct reading of

SECTION 5. There shall be an auxiliary board of health in each county in the State. The boards shall be composed of all registered physicians resident in the county. From this number one physician shall be chosen by the board of commissioners of each county annually on the first Monday in May of each year to serve with the title of superintendent of health, and the said board of commissioners shall fix the compensation of said county superintendent of health. His duty shall be to gather vital statistics upon a plan designated by the State Board of Health. He shall always promptly advise the Secretary of the State Board of the unusual prevalence of disease in his county, especially of typhoid fever, scarlet fever, diphtheria, yellow fever, small-pox, or cholera. His reports shall be made regularly, as advised by the State Board, through their Secretary; and he shall receive and carry out as far as possible such work as may be directed by the State Board of Health. He shall make the medico-legal post-mortem examinations for coroner's inquests, and attend the prisoners in jail, home for the aged and infirm, and house of correction, and make an examination of lunatics for commitment. He shall be the sanitary inspector of the jail and home of his county, making monthly reports to the board of county commissioners: *Provided further,* that it shall be unlawful for said county commissioners to elect any one not eligible to membership in the county board to the office of county superintendent of health, if any such qualified physician can be found in the county willing to accept the office.

SEC. 9. Inland quarantine shall be under the control of the county superintendent of health, who shall see that diseases especially dangerous to the public health, viz.: small-pox, diphtheria, scarlet fever, yellow fever, typhus fever and cholera, are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge; and that after the death or recovery or removal of a person sick of either of the diseases mentioned, the rooms occupied and the articles used by the patient are thoroughly disinfected in the manner set forth in the printed instructions, both as to quarantine and disinfection, which shall be furnished him by the Secretary of the State Board of Health. The expense of the quarantine and of the disinfection shall be borne by the householder in whose family the case occurs, if able, otherwise by the city, town or county of which he is a resident. The failure on the part of a county superintendent of health to perform the duties imposed in this section shall be punished by the deduction of five dollars for each day of delinquency from his salary by the board of county commissioners; and if it shall appear to the satisfaction of the county board of health that the death of any person from the spread of the disease can justly be attributed to such failure of duty on his part, he shall be deposed from office and a successor immediately elected to fill out his unexpired term. Any person neglecting or refusing to comply with or in any way violating the rules promulgated in the manner above set forth on the subjects of quarantine and disinfection, shall be deemed guilty of a misdemeanor, and upon conviction shall be fined or imprisoned, at the discretion of the court, not less than five nor more than fifty dollars or less than ten nor more than thirty days. In case the offender be stricken with the disease for which he is quarantinable, he shall be subject to the penalty on recovery, unless in the opinion of the superintendent it should be omitted: *Provided, however*, that in any city or incorporated town having a regularly appointed medical health officer who is a member of the county board of health, the duties assigned in this section to the county superintendent of health shall be performed by the said medical health officer for the people of his city or town, and he shall be subject to the same penalties for dereliction of duty at the hands of the board of aldermen or town commissioners as are directed to be imposed by the county commissioners and county board of health upon the superintendent: *Provided, further*, that the quarantine of ports shall not be interferred with, but the officers of the local and State boards shall render all aid in their power to quarantine officers in the discharge of their duties upon the request of the latter: *Provided*, that the custody and care of any child or other person may remain in custody of parent or family.

SEC. 10. When a householder knows that a person within his family is sick with either of the diseases enumerated in section nine, he shall immediately give notice thereof to the health officer or mayor, if he resides in a city or incorporated town, otherwise to the county superintendent of health, and upon the death or recovery or removal of such person the rooms occupied and the articles used by him shall be disinfected by such householder in the manner indicated in section nine. Any person neglecting or refusing to comply with any of the above provisions shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one dollar nor more than fifty dollars.

SEC. 11. When a physician knows that a person whom he is called to visit is infected with small-pox, diphtheria, scarlet fever, typhus fever, yellow fever or cholera he shall immediately give notice thereof to the health officer or mayor, if the sick person be in a city or incorporated town, otherwise to the county superintendent of health, and if he refuses or neglects to give such notice of it in twenty-four hours he shall be guilty of a misdemeanor and shall be fined for each offense not less than ten nor more than twenty-five dollars. And it shall be the duty of the said county superintendent, health officer or mayor receiving such notice of the presence of a case of small-pox, yellow fever, typhus fever or cholera within his jurisdiction to communicate the same immediately by mail or telegraph to the Secretary of the State Board of Health. A failure to perform this duty for twenty-four hours after the receipt of the notice shall be deemed a misdemeanor, and shall subject the deliqtient upon conviction to a fine of not less than ten nor more than twenty-five dollars.

SEC. 13. The school committees of public schools, superintendents of graded schools and the principals of private schools shall not allow any pupil to attend the school under their control while any member of the household to which said pupil belongs is sick of either small-pox, diphtheria, measles, scarlet fever, yellow fever, typhus fever or cholera, or during a period of two weeks after the death, recovery or removal of such sick person; and any pupil coming from such household shall be required to present to the teacher of the school the pupil desires to attend a certificate from the attending physician, city health officer or county superintendent of health of the facts necessary to entitle him to admission in accordance with the above regulations. A wilful failure on the part of any school committee to perform the duty required in this section shall be deemed a misdemeanor, and upon conviction shall subject each and every member of the same to a fine of not less than one nor more than twenty-five dollars: *Provided*, that the instructions in accordance with the provisions of this section given to the teachers of the schools within twenty-four hours after the receipt of each and every notice shall be deemed performance of duty on the part of the school committee. Any teacher of a public school and any principal of a private school failing to carry out the requirements of this section shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one nor more than twenty-five dollars.

SEC. 23. *Vaccination.*—On the appearance of a case of small-pox in any neighborhood all due diligence shall be used by the superintendent of health that warning shall be given, and all persons not able to pay shall be vaccinated free of charge by him, and the county superintendent shall vaccinate every person admitted into a public institution (jail, county home, public school) as soon as practicable, unless he is satisfied upon examination that the person is already successfully vaccinated; the money for vaccine to be furnished by the county commissioners. The authorities of any city or town, or *the board of county commissioners of any county, may make such regulations and provisions for the vaccination of its inhabitants under the direction of the local or county board of health or a committee chosen for the purpose, and impose such penalties as they may deem necessary to protect the public health.*

SEC. 24. The board of county commissioners of each county is hereby authorized at any time to call a meeting of the county board of magistrates or justices of the peace to take into consideration the health interest of the people of their county, and, with the approval of the said board of magistrates, to levy a special tax to be expended under the direction of a committee composed of the chairman of the board of county commissioners, the mayor of the county town and the county superintendent of health for the preservation of the public health.

A perusal of the following extracts from the BULLETIN, which is, in effect, a monthly letter to all physicians, chairmen of boards of county commissioners, mayors, etc., in the State (in addition to numerous letters of hand and telegrams to individuals), will show the further work done in attempting to control the disease. Special attention is called to the decision of the Supreme Court affirming the legality of compulsory vaccination—a most important and valuable decision—printed in the BULLETIN for March, 1900.

[*From the Bulletin of January, 1899.*]

SMALL-POX AGAIN.

We are just in receipt of a letter from a county superintendent of health, announcing a fresh outbreak of small-pox "in another part of the county, but communicated from the old cases." He goes on to say: "There are now ten or more new cases of small-pox. I am doing the best I can, under th eexisting law, to prevent it spreading by having the parties quarantined, but it is next to impossible to stop all communication. Those who violate the law are usually those who are in communication with the disease, and are unable to pay a fine, so would have to be committed to jail for punishment. By so doing the inmates of the jail would be infected. So what best to do is giving our board of commissioners no little trouble. The present board of commissioners will do all they can."

Knowing the superintendent above referred to to be a man of great courage and energy, and believing what is said of the board of county commissioners from an acquaintance of many years with its chairman, it seems to us that the problem ought to be solved without any very great difficulty. Ample powers are conferred by the law, and the superintendent and board of commissioners working in harmony, the latter supplying the necessary money and moral support, for when one man has to do unpopular things it is a great help to have somebody to back him up, could effectively enforce the regulations. In section 9 of the law we find that "any person neglecting or refusing to comply with or in any way violating the rules promulgated in the manner above set forth on the subjects of quarantine and disinfection shall be guilty of a misdemeanor, and upon conviction shall be fined or imprisoned, at the discretion of the court, not less than five nor more than fifty dollars, or less than ten nor more than thirty days." In section 10 the householder and in section 11 the attending physician are both subject to fine up to fifty dollars for not giving immediate notice of the presence of a case of small-pox. In sections 14 and 15 provision is made for the management of infected persons coming from another place and for travelers from an infected place in another State. In section 23, under the head of "Vaccination," we find this: "The authorities of any city or town, or the board of county commissioners of any county, may make such regulations and provisions for the vaccination of its inhabitants under the direction of the local or county board of health, or a committee chosen for the purpose, and impose such penalties as they may deem necessary to protect the public health." Section 25 empowers all cities and towns to make any sanitary regulations they please.

From the above epitome of the more essential portions of the law bearing on small-pox, it seems to us that there is law enough and that the proper execution of it is all that is needed to control any outbreak, if action be prompt and thorough.

That this is not as easy in practice as it sounds we freely admit. The failure to report the presence of the disease at once, from ignorance or other reasons, is one of the serious difficulties in the very beginning; the difficulty of enforcing effectively a quarantine in the country referred to by our correspondent and the prejudice against vaccination we do not forget. But at the same time the disease can be managed under the conditions that obtain with us in North Carolina, and in proof that it can be, we ask the reader who has followed us thus far to refer to Superintendent Long's article in the last issue of the BULLETIN, and to read the following gratifying letter from the superintendent of Northampton county, the same being a reply to a circular-letter sent on the 10th inst. to all superintendents, asking for suggestions as to amendment of our health laws and also an amplification of a telegram sent before, announcing the appearance of a case of small-pox, as showing admirably in a few words "how to do it":

JACKSON, N. C., January 11, 1899.

DR. RICHARD H. LEWIS,
Secretary State Board of Health, Raleigh, N. C.

MY DEAR SIR:—Your letter of January 10th to hand. I note with regret that an effort may be made to amend the health law of our State (chapter 214, Laws, 1893). Any interference with this law as it now stands upon our statute books would be, in my opinion, a grave mistake. This law, as it now stands, is well-nigh perfect in its practical workings. I speak from experience. For instance, on January 7, 1899, I was notified of a case of small-pox in this county (Northampton). By four o'clock in the afternoon of the same day this case was quarantined, also eight persons supposed to be infected. On January 9th I called the board of county commissioners together, and a compulsory vaccination, under penalty, was ordered within a radius of six miles, the infected houses being taken as a centre.

I had already telegraphed for virus, and by Tuesday night, January 10th, over 125 compulsory vaccinations had been made. This law has the approval of every intelligent man and tax-payer in this county. It gives us an efficient weapon with which to fight and stamp out contagious diseases, such as small-pox, scarlet fever, diphtheria and others, something that we were woefully lacking in before the passage of this act.

This law is a model provision for the purpose intended, and while the superintendents of health for most counties get very small pay, their salaries being regulated by the board of county commissioners, yet this law gives the greatest protection to person and property of the people of this State.

It can be said of this law that it can be put in operation almost instantly. I desire to urge upon you the great importance to the people of North Carolina generally, the towns and cities especially, of keeping this law intact as it now stands.

Very respectfully,
HENRY W. LEWIS,
Superintendent of Health Northampton County.

It seems to us Dr. Lewis has told the whole story. We wish to call attention particularly to: (1) His promptness. Before the sun set on the day he was notified of the case of small-pox (eight miles in the country, we learn from another communication) the case and eight other persons, who had been exposed, were quarantined. (2) To the fact that he took upon himself the responsibility of ordering by wire the vaccine virus to avoid delay that would have been occasioned by waiting for a meeting of the board of commissioners to authorize its purchase. (3)

To the early meeting of the board, their ready apprehension of the situation and the thorough-going methods of management, particularly in the matter of the compulsory vaccination of every one within a radius of six miles of the infection immediately ordered by them and executed by the superintendent.

Even at the risk of repeating it *ad nauseam*, we will say once more that the proper management of an outbreak of small-pox is summed up in (1) vaccination at the earliest possible moment of all persons who have been exposed to the disease and everybody else in the immediate neighborhood; (2) the removal of the patient to a special hospital for such cases and the thorough disinfection of the house and its entire contents as soon as he leaves it; (3) the strict isolation of all persons suspected of infection in a house of detention until the incubation period has been fully passed, and (4) the most watchful and unceasing care in the matter of disinfection in all directions in relation to the attending physician himself, the nurses, clothes, bedding, house and everything. Should it be found that there is any disposition to ignore or violate the regulations the immediate imposition of a severe penalty would stop it. Let us suppose the violator to be one too poor to pay a fine, and presenting such a case as is described by our first correspondent. Commit him to jail—in the house of detention for the first part of his sentence, but when his period of incubation has expired have him bathed and well disinfected and clothing him in a clean suit of clothes, put him in the common jail for the remainder of his sentence. There would be no more infractions of the rules. As mentioned at the time in our columns, the prompt commitment to jail of a man who refused to be vaccinated, by the mayor of Charlotte, brought him to terms in less than twenty-four hours, and materially aided in the accomplishment of the vaccination of the people.

We trust our readers will pardon our ringing the changes on the fundamental principles of the management of small-pox, but that disease is the danger of the hour in this latitude, and it is one with which, we are happy to say, our people are not familiar.

At present small-pox exists in McDowell, Northampton, Edgecombe and Tyrrell counties—not widespread as yet in either locality.

A WORD WITH THE BOARDS OF COUNTY COMMISSIONERS OF THE STATE.

Small-pox is at this present writing a menace to the people of our whole State. It already exists in four counties in the State, as mentioned above. It is liable to spread from those counties, or centres of infection, not only to people in the immediate neighborhood, but in these days of easy and rapid transit, to more remote communities. We are also threatened from our sister States to both the north and south of us. As is now generally known, it exists in Norfolk and its neighborhood, especially Berkley, from what we can learn. The city of Norfolk itself seems to be managing its outbreak well, but we do not feel so well satisfied about the outlying districts. Owing to the intimate relations, both business and social, existing between Norfolk and the eastern section of the State particularly, a sharp eye should be kept on persons coming thence, or from the towns adjacent to it. As the disease is limited almost entirely to negroes, we think it would be well, for the present at least, to limit anything like a a strict surveillance to that class. There are also forty-five cases in Sumter county, S. C., and travelers from that locality should be regarded with a watchful eye.

The mere statement of the facts just enumerated demonstrates the reality of the danger that threatens us. The question now before us is how to avert the danger. The prime responsibility rests upon the superintendents of health, whose duty it is to see that each case of the more dangerous contagious diseases is promptly quarantined and that thorough disinfection is employed, but inasmuch as he is not possessed of the means to successfully grapple with an outbreak of any size unless supplied by the county commissioners, the latter, it seems to us, are almost equally responsible. It is a very grave responsibility, and should be most seriously considered. As there is no way of telling when a case may appear, and as the necessary preparations for properly caring for it cannot be made instantly, it is clearly advisable, to express it very mildly, that these preparations should be made in advance, partially at any rate, so that they can be completed without loss of time. In the very first place, the most important step, the vaccination of the people, should be taken without delay. The superintendent should be authorized to purchase a sufficient supply of good vaccine virus that he may vaccinate the children of the public schools, the inmates of the county home and of the jail, and all persons unable to pay. If the danger be universal other physicians should be employed to assist him. The board of commissioners is fully empowered in section 23 of the law to make such regulations and impose such penalties as may be necessary to enforce vaccination, and it ought not to hesitate about doing it. Thorough vaccination of all the people solves completely the small-pox problem. In the second place arrangements should be made for taking immediate possession of two houses suitably located, when the occasion arises, for isolating and caring for patients and those who have been exposed to the disease until a sufficient time has elapsed to prove that they are not infected. When the time comes these establishments must be manned with the necessary guards, nurses, cooks, etc., that the requirements of simple humanity may be met. These arrangements of course would cost something, but as the cities and towns would be peculiarly endangered, from a business as well as a medical point of view, it would be to the mutual interest of both town and county to join forces in this matter, thereby dividing the expense. But after all what would the expenditure amount to in comparison to the suffering and death and loss in business that a neglected epidemic of small-pox would surely entail?

We wish to call the attention of the commissioners of those counties having no superintendent of health to the fact that they have no legal machinery for the management and control of contagious diseases. The law invests these powers in an official whose title is county superintendent of health and explicitly, in section 5, commands the commissioners of every county to elect such an officer. Why some boards, in view of their oath of office, have failed to perform this plain duty we have never been able to understand, but some boards have failed to do so. We have received an explanation from one very small county in the statement that no doctor could be found who was willing to take the place; but what inducement was offered the doctor was not mentioned. The present boards being all new boards, and but recently installed in office, we hope they will repair this serious omission of their predecessors. You may not realize ordinarily the value of a superintendent of health, but if small-pox should invade your county, as may happen any day, you will feel the need of some one legally empowered and required to take charge of the management of it. Gentlemen, "*now* is the accepted time." Act at your next meeting in February.

In conclusion, we hope you will pardon us for saying a word in regard to the compensation of superintendents of health. As a rule, from what we can learn, they are underpaid, and in one or more counties the office is farmed out to the lowest bidder—a sure guarantee of an inferior man, who would, in all probabity, not earn the pittance he accepts. But it is not so much in regard to the pay under the usual circumstances we wish to speak as it is to the remuneration during the presence of small-pox. Believing the men now filling the office of county commissioner to be men of intelligence and character and just-minded, we take it that there is probably no reason for the suggestion, but you will pardon us for suggesting that when the superintendent has to deal with an outbreak of small-pox he deserves reasonable extra compensation. His patients are apt to become afraid of him while engaged in this work and he is forced to make a much greater personal sacrifice than ought in justice to be demanded of him.

[*From the Bulletin for February-March, 1899.*]

SOME ADDITIONAL REMARKS ON SMALL-POX.

We almost feel as if we ought to apologize to our readers for dwelling so much upon the subject of small-pox, but it is becoming day by day a more and more serious question with us. It is constantly springing up in new places and now presents seven *foci* of infection in the State, to say nothing of Virginia and South Carolina. The management of small-pox outbreaks is theoretically simple and easy, and so it would be practically but for obstructions and difficulties for which we fear our own profession is largely to blame. For example: 1. The reluctance in some cases on the part of the attending physician to make the positive diagnosis of small-pox. He hems and haws, perhaps, and finally winds up by calling for an expert, thereby losing valuable time, to say the least. We hope we will not be misunderstood. There are undoubtedly cases now and then which are not easy of diagnosis, especially to one who has, perhaps, never seen a case, but under the conditions now prevailing, with small-pox everywhere, and in view of the universally recognized opinion that during the prevalence of that disease the proper thing to do, whenever there is any doubt about the diagnosis, is to give small-pox the benefit of the doubt, it does seem to us that except in very rare instances there ought to be no hesitation about it. But there too often is. Only the other day one of our best men, and a warm friend of ours, "hollered" for an "expert." We requested a distinguished member of the board of large experience to go to his aid. He did so promptly. Our friend wrote thanking us for sending him, etc., which we appreciated, but not being in a very amiable frame of mind about his "playing the baby act," as we call it, it was with deep, inward, though possibly wicked, satisfaction we read this: "Dr. ——— came, saw the case and announced that 'so plain a case of small-pox was it that the wayfaring man, though a ——— fool, could tell it *afar off*.'" While the expert's style of expression might be regarded possibly by some as a trifle strong, it was picturesque and unquestionably effective in its influence on public opinion.

2. The disposition exhibited by some physicians, although they have nothing to do with the case, and often refuse an invitation to see it for fear of the effect on their practice, to belittle it and cast doubt on the diagnosis, thereby unsettling the public mind and directly encouraging the people in their opposition to vaccination or other necessary precautions that may be irksome or inconvenient. In a letter from a leading citizen of one of our towns in which this state of affairs existed, in spite of the unanimous opinion of all of the four physicians who saw the cases in consultation, he said that at least eighty per cent. of the people rebelled against the preventive regulations ordered, while he was satisfied they would not only submit but assist in carrying them out if the diagnosis should be confirmed by an expert from a distance. Now, it is perfectly apparent that the hostile attitude of the public was incited and fostered by the physicians who made light of the diagnosis of small-pox, calling it chicken-pox, when they had never seen it. Unfortunately one of the cases of "chicken-pox" died, and the expert who was sent said there was no doubt about the nature of the disease—that it was small-pox. Such conduct strikes us as being extremely reprehensible and inexcusable. It is directly against the interests of the community, and must react injuriously on those so conducting themselves. If when a

case is diagnosed as small-pox all the physicians in the town who have not seen it assume with the public that it is correct, there would be very little trouble in enforcing the necessary regulations.

3. Prejudice against vaccination. This seems to be more marked among the operators of cotton-mills than any other class. This is a very serious matter, for owing to their being crowded together they present a most favorable field for the spread of small-pox. We are mindful, of course, of the natural reluctance of one who earns his daily bread with his hands to jeopardize for a time even the use of his hands, but the danger of disability is exaggerated beyond measure. As a matter of fact we fear that the objection to vaccinnation, not only on the part of mill operatives, but unfortunately of a great many other people, is simply blind prejudice. As this attitude of mind is nearly always associated with ignorance the subjects are practically not amenable to reason. So that for the protection of the community some degree of compulsion is necessary. As suggested in a former issue of the BULLETIN, it has occurred to us that an announcement on the part of the employer that in cases of disability from vaccination pay sufficient to prevent suffering would be continued during such disability would remove the basis of a reasonable objection on the part of the employee. As the tendency among operators, upon the appearance among them of small-pox, is to scatter and seek employment at other mills, it strikes us that an arrangement or agreement among all mill-owners not to employ hands from other mills unless they brought a certificate from their last employer stating time of departure and asserting absence of small-pox at said time, would be a great protection.

SMALL-POX INSPECTOR FOR THE STATE.

Doctors Thomas and O'Hagan, a committee of the Board, made, the first week in March, an examination into the small-pox conditions in the eastern part of the State. They found them to be so threatening that the President called a special meeting of the Board at Raleigh, Sunday, March 5th, to consider them. The action taken is stated in the following extract from the minutes: "In view of the gravity of the situation, increased by the inefficiency found in some places and the widespread opposition to vaccination found generally, it was unanimously decided, after discussion, to ask the Governor to authorize the expenditure of a sufficient amount of the contingent fund conditionally appropriated in section 29 of the Act in Relation to the Board of Health for visitations of pestilential disease, to employ a special inspector to visit all infected points, thoroughly inform himself of the situation, and advise the local authorities as to the best management of the outbreak in every respect, including particularly the value and importance of vaccination, said inspector to receive instructions from and report to the Secretary of the Board."

Having adopted this resolution, the Board repaired to the Executive Mansion, where it met with a pleasant reception from his Excellency, who showed an intelligent appreciation of the situation, and promptly authorized the proposed expenditure for the purpose mentioned. In completion of this action on the part of the Board, Dr. Henry F. Long, of Statesville, was appointed small-pox inspector. Our readers will remember the excellent paper by Dr. Long on the management of a considerable outbreak in his own county of Iredell, which appeared in the January number. We deem ourselves fortunate in having secured his services, for in addition to being a man of sense and force he has had exactly the experience that will fit our conditions. We bespeak for him from the communities he may visit a respectful hearing of his advice and suggestions—they will be worth listening to.

Upon inquiry of the committee, we learned that wherever they found the physicians of a community united and harmonious there was no trouble in getting the people vaccinated and the regulations carried out—that whenever there was any it could nearly always be traced to some "kicking" doctor. This coincides with our own observation, as has already been expressed, but we do hope that our brethren who are constitutionally disposed to take "the other side" will for the public good carefully avoid saying or doing anything that might be seized on by the people as an excuse. Let's all pull together!

[*From the Bulletin for April, 1899.*]

THE SMALL-POX SITUATION.

The small-pox situation in the State is at this present writing (April 21) much the same as a month ago, though somewhat improved. Of the nineteen counties then reported as having the disease, seven, Tyrrell (?) (there is no superintendent of health in Tyrrell, we regret to say, and our information is hearsay), Columbus, Wilson, Edgecombe, Halifax, Northampton and Johnston have gotten rid of it, for the time being, at any rate; while in three others (Alamance, Moore and Warren) no new cases have been reported and the patients are about ready to be discharged. New cases since the March reports, however, have appeared in Anson (report from Anson unsatisfactory, but there are apparently several); Union, 2; Mecklenburg, 1; Chatham, one negro family, number attacked not given; Beaufort, 2; Iredell, 1, varioloid, and additional cases in Gates and Wake. So that there are now sixteen counties having small-pox instead of nineteen last month. In most instances the number of cases is small, the disease is mild in character, and the outbreaks are well managed. On the whole, the condition of affairs is much more satisfactory, for which credit is largely due to the earnest and well-directed efforts of our faithful and efficient Small-pox Inspector, Dr. Henry F.

Long, of Statesville. We have received from the communities he has visited nothing but words of commendation of his work and thanks to the Board for sending him.

As we have said before, we find that where all the physicians pull together, and the authorities promptly institute thorough measures and the health officer attends to his duties, there has been no trouble in controlling the disease. In this connection, as a suggestion to our medical brethren in other counties, we take much pleasure in printing the following strong and pointed resolutions adopted by the physicians of Edgecombe when small-pox first appeared in that county:

"WHEREAS, A committee of the auxiliary board of health of Edgecombe county, after due investigation, has reported that the disease now prevailing in epidemic form in Hickory Fork township, Edgecombe county, is small-pox; and,

"WHEREAS, Vague rumors have reached the ears of the board that some physicians are inclined to discredit such report, to discourage the efforts being made to prevent the spread of the contagion, and otherwise embarrass the members of the board in the discharge of their duties; therefore,

"*Resolved* 1. That it is the opinion of the auxiliary board of health of Edgecombe county that the epidemic now prevailing in No. 3, or Hickory Fork township, is small-pox.

"2. That any physician who shall be called to suspicious or well-marked cases, and shall fail to report same immediately, shall be dealt with according to law."

This has the right ring. We would remind our readers that the last clause in the resolutions means "shall be fined for each offense not less than ten nor more than twenty-five dollars." Similar action promptly taken would have saved much trouble in one or more counties we could name.

A WORD TO THE BOARDS OF COUNTY COMMISSIONERS.

At your next regular meeting, the first Monday in May, it will become your duty to elect a county superintendent of health, to hold office for one year. We would respectfully call your attention to the prime importance of selecting competent men for that very responsible position—men of intelligence, common sense, energy and conscientiousness. Those of you who have had small-pox in your counties doubtless realize this as you never did before, and those whose counties have so far escaped would do well to bear it in mind, for the disease is likely to visit you any day. We also beg to call the attention of the boards of the few counties having no superintendent to their helplessness without such an officer of the law in such a contingency, and to express the hope that they will remedy that condition. The term of office of all superintendents expires and a new term begins, under the law as amended in 1897, the first Monday in May.

We feel sure that in making their selection the commissioners will not be unmindful of the sacrifices made by those superintendents who have to manage outbreaks of small-pox in the loss to their private practice entailed thereby. Unless this pecuniary loss has been offset by liberal extra pay, it seems to us that simple equity demands the re-election of such superintendents, provided they have shown themselves faithful and competent.

[*From the Bulletin for January, 1900.*]

THE SMALL-POX SITUATION.

It is with much regret that in the conditions as regards small-pox now prevailing in the State, we find the fulfilment of our prediction that the disease would in all probability be worse this winter than it was last. The reports from county superintendents of health for December, 1899, show small-pox present in fifteen counties, the total number of cases being 162, plus "a few" in Davidson county (see review of diseases for December, 1899). Since the first of January new *foci* of infection have developed in eleven additional counties, namely, Alamance, Bertie, Davie, Forsyth, Gates, Moore, Orange, Richmond, Robeson, Stanly and Watauga—one case only in all but Gates and Richmond—and some outbreaks have materially increased in extent. As definite reports are only made to us monthly, we are unable to give the exact number of cases at this writing, but it is certainly much greater than it was two weeks ago. In a word, small-pox is spreading rapidly in North Carolina just now. The causes are failure in previous cases to enforce proper disinfection of premises and personal effects of the patients, neglect of vaccination, and the "kicking doctor."

As nearly every outbreak can be traced to a visitor from another State, our own health officers, it appears, are not often to blame, but those of our neighbors. At the same time we cannot say that we are entirely without sin in this respect and we trust that all our county superintendents of health and municipal health officers will be very careful in this matter of disinfection. "A lick and a promise" will not answer, but the work must be *thoroughly* done to be effective, or seed-beds for another crop next winter will be left. For all outbreaks of this origin, the health officer is responsible, for the law definitely and positively makes it his duty to see that both quarantine and disinfection are properly carried out. He should never forget the fearful consequences that may follow a neglect in any particular of this most important duty.

The neglect of vaccination is attributable to several causes. In the first place, to an unreasonable prejudice against it on the part of many people, chiefly of the more ignorant classes. Owing to the remarkable mildness of the disease as it has so far appeared, the death rate being less than two per cent., the corrective effect of fear cannot be brought to bear with much force upon this prejudice. So that this attitude on the part of the people can be understood, and in the case of the laboring man who, with his family, is dependent upon manual toil, perhaps, excused. But there is another influence which re-enforces this prejudice and mightily supports the obstructionists, and that is what we call, rather inelegantly, perhaps, the "kicking doctor." We had occasion to refer to him last season, but we had hoped that with increase of knowledge he would disappear, but it seems that he is still with us. Generally the physician who has talked the loudest and longest in dispute of the diagnosis of small-pox has uniformly and persistently refused all invitations to see the case, and for him, of course, there can be no excuse whatever. But when the disease first appeared there was undoubtedly often reasonable ground for doubt on the part of even intelligent and learned physicians.

The disease as it has appeared in this country during the past two years, in addition to its extraordinary mildness in most cases, has assumed irregular and unusual forms, different in some respects from the descriptions to be found in the text-books—the only sources of information, fortunately, for many years available to an immense majority of our medical practitioners. Hence, the chief reason for the mistakes in diagnosis. In nearly every instance, however, the exceptions having been very rare, experts have declared the disease to be genuine small-pox. Now, these facts have been before the medical public for at least a year, and one would think that they would be given due weight in coming to a conclusion, but to our mind the strangest feature of the position of those denying the diagnosis of small-pox has been almost their invariable contention that the disease was chicken-pox, even when occurring in adults. We are sure we are not expressing it too strongly when we say that every physician that can fairly claim to be well informed knows that chicken-pox is so rare in adults that it is practically unworthy of consideration in making a diagnosis of an eruptive disease in a person past the period of childhood. We will wager that not one per cent. of the physicians of North Carolina saw a single case of chicken-pox in a grown person in the ten years preceding 1898, notwithstanding its frequent prevalence among the children of their clientele. Then, why so many cases of chicken-pox now, when it is known of all men that genuine small-pox, although frequently atypical in form, is widely prevalent.

As we do not claim to be an authority on this subject, we beg leave to support our position by the following quotations from those acknowledged by all to be among the highest authorities, which we find reprinted in a recent supplement of the *Ohio Sanitary Bulletin* from the nineteenth annual report of the South Carolina Board of Health:

Osler, Principles and Practice, Second Edition, page 69: "Varicella is an acute contagious disease of children, it is a disease of childhood. A majority of the cases occur between the second and the sixth year. It is rarely seen in adults."

Keating Ency. Diseases of Children, article Varicella, by Dr. Charles G. Jennings: "An acute specific infectious disease peculiar to childhood. In children over ten years of age the disease is rare, while in adult life it is so infrequent that many observers of large experience have not met with it. Varicella is particularly a disease of infancy and early childhood. Any varicella-like eruption in an adult should be looked upon with the greatest suspicion and the patients strictly isolated until by the history of the case, its source and the course of the disease, all doubts as to the diagnosis is dispelled."

Dr. James Nevens Hyde, in Pepper's System of Medicine, says: "Varicella is essentially a disease of early life, occurring almost exclusively in infants and young children."

Alex. Collie (Quain's Dictionary of Medicine) says: "It is certain it arises from contagion, and childhood is a predisposing cause. It occurs in children at the breast, and is seen with increasing frequency up to the fourth year, at which period it attains its maximum. It is less often found between four and twelve, and after twelve it may be said to disappear, although it is occasionally seen in adults."

Bartholow's Practice of Medicine, Fifth Edition, page 717: "It is a disease of childhood, and rarely attacks any above ten years of age."

Dr. Louis Thomas (Leipzig Ziemssen's Cyclopædia) says: "Varicella is a disease of childhood and attacks by preference young children and even sucklings. In children over ten years of age attacks are infrequent, and I never saw an adult suffering from varicella. Eruptions resembling varicella in adults always indicate variola."

To these we would add:

Dr. James T. Whitaker (American Text-book of Theory and Practice of Medicine, page 299) says: "It (varicella) is confined exclusively to childhood (exceptions having been noted by Heberden, Gregory and Seitz) up to the age of ten, and is rare after twelve."

We hope that hereafter any physician who feels it incumbent upon him to uphold the proverb, "doctors differ," when the case under consideration is an adult, and especially if the history of recent successful vaccination is not clear, will fall back on something else than chicken-pox—say "*impetigo contagiosa*"—it sounds bigger—or "Cuban itch," or "elephant itch," or "Georgia bumps," or "any other old thing." But jesting aside, this is a very serious matter, as we know from experience. This refusal to accept the diagnosis of small-pox, which, with very rare exceptions, has always proved to be correct, by a few physicians—not many we are glad to say—has done much harm in our State. It has furnished a rallying cry for those opposed to vaccination, it has undermined public opinion, and it has supplied an excuse for inaction to weak-kneed officials. As every one knows, promptness and thoroughness of action upon the appearance of a case of small-pox in a community, in isolating the case and all who have been exposed, and in vaccinating all the people, are absolutely necessary to its complete control. The "kickers" impede and delay this action, and in so far interfere with the welfare of the people.

We admit, of course, the right of every man to his own opinion, but we deny the right to an unnecessary public expression of that opinion when it is calculated to endanger the lives and prosperity of his neighbors.

In the face of the conditions that now confront us, it seems to us, with all due deference, that the proper attitude of the patriotic physician toward small-pox is this: If he has not seen the case, he cannot, of course, give an opinion as to the diagnosis, but if asked directly he should say—as the present state of affairs would fully justify—that he does not know, not having seen it, but that in view of wide dissemination of the disease throughout the State and country, it is most likely small-pox, and advise the questioner to be vaccinated with all under his control at once. If he has seen the case first and has the slightest doubt about its nature he should call a consultation immediately. If there is still reasonable doubt about it after careful consideration, an expert should be asked for. In the meantime he should give the people the benefit of the doubt, which is the accepted rule under such circumstances, and although personally he might honestly believe it to be some other disease, he should bury his opinion for the time, and to all questions say: "It is doubtful. Be vaccinated." This course should also be pursued by consultants.

Knowing the physicians of the State to be as a class a high order of men, we hope and believe that the course of action suggested above would be followed of their own motion, but small-pox is a comparatively new disease with us, its occurrence in a community causes much excitement and anxiety among the people, their doctor is the one to whom they first turn, and in view of the gravity of the situation and of their power to control it, we trust the word of warning we have felt it our duty to utter will not be taken amiss, for a grave responsibility rests upon every one of us in this matter.

Under the present circumstances every case of eruptive disease resembling small-pox, about which there is the slightest doubt, should be managed as if it were small-pox until it is disproved.

THE DIAGNOSIS OF SMALL-POX.

In view of the atypical character of many cases in the prevailing outbreak of small-pox and the consequent difficulty in making a positive diagnosis; of the great importance of coming to a definite conclusion *promptly;* and of the fact that any physician is now liable to be called on at any time to make the diagnosis, we feel that our kind medical readers will appreciate the following liberal extract from a recent circular, which explains itself:

THE DIAGNOSIS OF SMALL-POX.

Circular issued by Provincial Board of Health of Ontario to Physicians, Medical Health Officers and Members of Local Boards of Health of Ontario.

DEAR SIRS:—In consequence of the occurrence during the past year of an eruptive contagious disease in many parts of the continent of America presenting some of the characteristics of small-pox, yet so mild in the large proportion of cases as to have caused a very low mortality, there has, as a consequence of this, resulted in many instances a failure to diagnose its true character. The disease has, therefore, in many States become epidemic, causing, if not much loss of life, at least great loss of time and money in suppressing it. Inasmuch as at any moment, especially in the coming cold weather, it may take on all the virulent characteristics of small-pox, the Provincial Board of Health desires to make all who may professionally or officially come in contact with the disease acquainted with its more marked characteristics.

The following are the signs and symptoms of small-pox generally noticed:

1. A prodromal period of more than twenty-four hours with headache, pain in back and vomiting.
2. The rapid abatement of prodromal fever and malaise on appearance of the secondary eruption.
3. A primary erythematous eruption or rash, especially covering the abdomen.
4. The appearance on the third day from onset of the papular eruption with its firm shot-like feeling, and the tendency of the eruption to appear especially on exposed surfaces, as face and wrists, notably on forehead and about nose and lips.
5. The appearance early of a red areola around the vesicles, which follow in successive crops for two or three days, becoming mature and pustular by the fourth or fifth day with their typical umbilication.
6. The appearance of the eruptive vesicles on the roof of the mouth and fauces—this being of special diagnostic value.

The rodent character of the pustules and the sub-cutaneous inter-cellular infiltration serve to complete a picture—which, if taken with the fact that it is a disease attacking adults equally with children, along with a history of probable infection—will cause in most instances the diagnosis to become easy.

All, however, who have come in contact with the present outbreak are agreed that these normal characteristics may be much modified.

Thus, Dr. John Coventry, medical health officer for Windsor, in substance states in a recent paper before the Windsor Medical Society, that:

1. Some have but little prodromal fever; some have pains in back, some do not; some vomit, some do not.
2. In some the eruption without shotty feeling appeared altogether and disappeared with one crop; in others there is the shotty feeling with the succession of crops.
3. All the secondary eruptions are papular in the first stage (there being seldom any primary rash) and become vesicles within two days; some have aborted at this stage and dried up, while others become semi-purulent, marked at the apex with a dark spot, but with no umbilication.
4. In no case has there been secondary fever.
5. Adults have had a more severe eruption than children, the vesicle in the latter blackening and drying up at the vesicular stage, the crust falling off at the seventh or tenth day from beginning of eruption.
6. Some have the eruption on the fauces and some have not.
7. None of the cases seen by him had been vaccinated; *while vaccinated persons living in contact with it do not contract the disease*, and children vaccinated in time in houses where it is have escaped it.
8. The outbreak has been traced to a man from a district where it prevailed epidemically.

William M. Welch, M. D., of Philadelphia, in a circular issued by the Pennsylvania State Board of Health, is quoted, in substance, as follows:

"After a careful examination, I have no hestitation in saying that the disease about Pittsburg is small-pox. It is extremely mild in character, so mild that many of the more usual symptoms are either absent or so indistinctly marked as to be overlooked. No weight should be given to the absence of the so-called characteristic small-pox odor, or of the secondary suppurative fever."

The circular issued by the State Board of Health of Indiana, states:

1. There can be no destruction of the true skin, but it will always be possible to find a few typical indurated pustules not simulated by any other condition.
2. It is characteristic that these pustules will not on pricking completely discharge their contents, but will be found to retain a firm base, raised somewhat above the level of the surrounding skin.

[*From the Bulletin for February, 1900.*]

A WORD AS TO QUARANTINE AND DISINFECTION.

As our readers are well aware, we are not a believer in the efficiency of the ordinary internal quarantine, by which we mean the attempt to prevent the introduction into an inland town of a contagious disease—say small-pox just now—from a neighboring town that is infected with it. Having previously given our reasons for holding to this opinion, we will not weary our readers with repetition of them further than to simply state once more what we regard as the chief objection to it. It is this: It lulls the people into a false sense of security and, in so far, interferes with the application of the only sure preventive of small-pox, namely, vaccination.

The aspect of quarantine that we now wish to consider is the quarantine of small-pox patients and those who have been exposed to the disease. In the management of an outbreak of small-pox this is, of course, all-important. It would be superfluous to dwell on this point, but for the fact that from certain things that have come to our knowledge we fear that in some instances the quarantine is executed in so careless and slipshod a manner as to practically nullify it. For example: A negro living in the country was found to have small-pox. He was left in his own house (one-room hut, probably), together with the other members of his family. Notices were stuck up around the house stating the presence of the disease and warning all persons not to leave or enter under a penalty of $25 fine. And this was all that was done. It is possible, of course, that the warnings were duly observed voluntarily by the inmates of the house, but it is extremely unlikely. It is somewhat more probable that the neighbors, for their own protection, took it upon themselves to see that they were heeded, but this is far from certain. In any event, this kind of quarantine cannot be depended on, and therefore should not be practised. As we understand it, no quarantine can be really effective without guards. Guards cost money, and there, we fear, is the trouble. The health officer may be thoroughly informed and earnestly disposed to do his duty in the matter, but unless he is supplied with the "sinews of war" by the authorities, county or town, he is helpless. A conscientious regard for the judicious expenditure of the people's money by those having it in charge is greatly to be commended, but judicious expenditure does not mean unwise withholding. We cannot imagine any better way to spend the public moneys than in protecting the people who furnish it from so loathsome a disease as small-pox. Generally, when the cases become numerous and the people get scared, the purse-string is loosed and the necessary appropriation made, but by that time it has become a large and expensive problem. It seems to be a difficult matter to get those in authority to realize that it is not only best in every way, but *cheapest,* to act *promptly* and thoroughly and nip the epidemic in the bud. In nothing does the old proverb, "a stitch in time saves nine," apply more forcibly than in this matter.

From several sources complaints have been made to us of carelessness on the part of physicians attending small-pox, that they do not change their clothes after visiting the patient nor take any reliable precautions against carrying about with them and distributing the contagion. We fear there is some ground for these complaints, and, if true, we must say that we cannot think of any valid defense against them. A suit of overalls, a yard or two of cheese-cloth for covering hair and beard, and a bichloride tablet are both easily obtainable and very cheap. The extra time and trouble required is too small a matter to be considered. Such carelessness on the part of the attending physician would not only vitiate the quarantine in itself but set a most unfortunate example. Precept is of no avail as against example.

Disinfection, we fear, is not always thoroughly carried out. Patients, we doubt not, are sometimes discharged too soon, before desquamation is complete. It should not be forgotten that desquamation is not always complete when the scabs have fallen off, but is going on as long, it is said, as the little red specks remain in the pits. And the period of desquamation is the most dangerous stage of the disease to others. But the greatest danger lies in the failure to properly disinfect the houses and effects of the patients. This is due, perhaps, in some cases to lack of the proper facilities, although sulphur and an iron pot are surely within reach of every one. The best method, however, from every point of view is, in our opinion, by formaldehyde gas. Good generators of the gas can be obtained for from ten to thirty dollars, and they will last indefinitely, and every county and town in the State should possess one. There will be constant need of them for disinfection after diphtheria and scarlet fever even after small-pox has disappeared. But as suggested in our last issue, small-pox will not finally disappear if proper disinfection is neglected, unless all the people are vaccinated, which seems to be a vain hope. It will continue to recur indefinitely. So the best investment of money and the best work, next to vaccination, is in the line of disinfection.

[*From the Bulletin for March, 1900.*]

THE LEGALITY OF COMPULSORY VACCINATION.

Our Supreme Court has just rendered a decision affirming the right of county and municipal authorities to enforce compulsory vaccination—greatly to our satisfaction, for an adverse decision would have been fraught with the gravest consequences to our people. It gives us, therefore, much pleasure to print below the able opinion of the Court as delivered by Justice Clark. Bearing as it does upon an always important and now especially interesting subject, we hope the newspapers of the State will give it wider publicity by printing it in their columns:

No. 169.

N. C. SUPREME COURT—February Term, 1900.

Alamance County.

STATE, Appellant, *v.* W. E. HAY.

Attorney-General for the State.

Defendant not represented.

Clark, J. Chapter 214 of the Laws of 1893 is a well considered and carefully drawn statute for the preservation of the public health. Section 23 thereof, which is specifically in regard to vaccination, contains among other provisions this clause: "The authorities of any city or town or the board of county commissioners of any county may make such regulations and provisions for the vaccination of its inhabitants under the direction of the local or county board of health or a committee chosen for the purpose, and impose such penalties as they deem necessary to protect the public health." There is no provision of the Constitution which forbids the Legislature so to enact, and it is indeed an exercise of that governmental police power to legislate for the public welfare, which is inherent in the General Assembly, except when restrained by some express constitutional provision.

Salus populi suprema lex, "the public welfare is the highest law," is the foundation principle of all civil government. It is the urgent cause why any government is established, for, as Burke says, "any government is a necessary evil." It is, however, a much lesser evil than the intolerable state of things which would exist if there were no government to bridle the absolute right of every man to do "that which seems right in his own eyes," like the Israelites in days of Micah. The above maxim, quoted from Lord Bacon, is placed appropriately first by Broom in his treatise on "Legal Maxims" with this just observation: "There is an implied assent on th- part of every member of society that his own individual welfare shall, in cases of necessity, yield to that of the community, and that his property, liberty and life shall under certain circumstances be placed in jeopardy or even sacrificed for the public good." This observation, which is almost a literal translation from Grotius, he fortifies by quotations from Montesquien, Lord Hale and many opinions from both sides of the Atlantic. But it needs none, for it is every-day common sense that if a people can draft or conscript its citizens to defend its borders from invasion it can protect itself from the deadly pestilence that walketh by noonday by such measures as medical science has found most efficacious for that purpose. We know as an historical fact that prior to the discovery one hundred and one years ago of vaccination by Edward Jenner, small-pox often destroyed a third or more of the population of a country which it attacked, and so futile was every precaution and the most careful seclusion, that the greatest sovereigns fell victims to this loathsome disease, which Macaulay has styled "the most terrible of all ministers of death." If this was so in days of imperfect communication, the present rapid means of intercourse between most distant points would so spread the disease as to quickly paralyze commerce and all public business, if government could not at once stamp out the disease by compelling all alike, for the public good as much as for their own, to submit to vaccination. Statistics taken by governmental authority show that while 400 out of every 1,000 unvaccinated persons exposed to the contagion are attacked by it, less than two in a thousand take the disease when protected by vaccination within a reasonable period. There are those, notwithstanding these well ascertained facts, who deny the efficacy of vaccination, as there are always some who will deny any other result of human experience, however well established, but the Legislature, acting in their best judgment for the public welfare, upon the information before them, has deemed vaccination necessary for public protection, and their decision, being within the scope of their functions, must stand until repealed by the same power.

The power of the Legislature to authorize county and municipal authorities to require compulsory vaccination has been exercised by nearly every State, and has been recently sustained by the highest courts of two of our sister States. Morris *v.* Columbus, 102 Ga., 792; Blue *v.* Beach (Supreme Court Indiana, February 1, 1900), 56 N. E. Rep., 89, and there are no decisions to the contrary. In reply to the argument that such exercise of power by the Legislature may in some cases infringe upon individual rights, Cobb, J., in the Georgia case just cited, well says: "No law which infringes upon the natural rights of man can be long enforced. Under our system of government, the remedy of the people, in that class of cases where the courts are not authorized to interfere, is at the ballot-box. Any law which violates reason and is contrary to the popular conception of right and justice, will not remain in operation for any length of time, but courts have no authority to declare it void merely because it does not measure up to their ideas of abstract justice. The motive which doubtless actuated the Legislature in the passage of the act now under consideration was that vaccination was for the public good. In this the General Assembly is sustained by the opinion of a great majority of the men of medical science, both in this country and in Europe."

But even if we were of opinion with the small number of medical men who contend that vaccination is dangerous to health and not a preventive of the disease, the court is not a paternal despotism, gifted with infallible wisdom, whose function is to correct the errors and mistakes of the Legislature. Brodnax *v.* Groom, 64 N. C., 250. Our people are self-governing, and themselves correct the mistakes of their representatives. The function of the courts is to construe and apply the laws, and they can hold a statute nugatory only when plainly and clearly violative of some provision of the organic law which has restrained the legislative power. Sutton *v.* Phillips, 116 N. C., 502; White *v.* Murray, at this term.

Nor does section 23 of the act require that the Board of Aldermen shall pass such ordinance in conjunction with the Board of Health (as the defendant contends). It merely provides that the execution of the ordinance, *i. e.*, the vaccination, shall be under the direction of the local board of health or a committee appointed by the aldermen.

While the Legislature has power to authorize municipal bodies to provide compulsory vaccination, and the defendant did not comply with the ordinance enacted by the town of Burlington, in pursuance of such authority, though afforded opportunity to do so, it is true that there may be some conditions of a person's health when it would be unsafe to submit to vaccination, and which therefore would be a sufficient excuse for non-compliance, but it does not vitiate the ordinance that such exception is not provided for and specified therein. It is not a defense that a person *bona fide* believes that it will be dangerous for him to be vaccinated or believes that he is already sufficiently protected by former vaccination, nor would the opinion of his personal physician on either point be conclusive (though it would naturally have weight with the jury), for there may be evidence or circumstances tending to the contrary. Indeed, as to a former vaccination being sufficient protection, the opinion of the official physician supervising the vaccination should be presumptively correct. That which would relieve from a complication with the ordinance is a matter of defense, the burden of which is upon the defendant, and is a fact to be found by the jury. The special verdict is ambiguous and defective in this particular and is set aside. Let there be a new trial.

SMALL-POX AND MUNICIPAL AUTHORITIES.

All cities and towns are, naturally and properly, very loth to advertise anything that is likely to interfere with their trade. In consequence there is a tendency, whenever there happens to be a difference of opinion among the doctors as to whether an eruptive disease is small-pox or chicken-pox, to agree with the latter and to announce to the world in the local papers that there is no small-pox in X, but that it is nothing but chicken-pox, and no one need hesitate to visit the town. Having recently called attention to the fact that whenever an impartial expert has seen the cases he has almost invariably pronounced them small-pox, we do not propose to dwell further upon this aspect of the subject. We propose to look at it for the present solely from the point of view of the trade of the town.

At first, in the beginning of the epidemic, the claim of chicken-pox may have been accepted by some, but now the people have "caught on." The claim has too often proved to be unfounded, and the outside public greet such assertions with a smile of incredulity. No matter how sincere the physicians and town authorities may be in their belief that the disease is chicken-pox—and we surely do not intend to intimate that they are ever otherwise than sincere—other people do not believe it. The result of this is liable to be distrust of all subsequent statements on the subject and a hesitancy in accepting the final announcement that there is no longer any small-pox in the town—the admission of the true nature of the disease having, after much resistance, been made. So that the restraint upon trade is continued much longer than legitimately it should be. According to our belief, the towns that suffer least from outbreaks of small-pox are those which promptly recognize and announce the disease, and which provide all the necessary facilities for taking care of it and preventing its spread. It is easy to understand how one would much prefer to visit such a community, knowing the authorities to be alert and on the watch for all cases, immediately segregating them in a pest hospital and all persons exposed to them in a house or camp of detention, than to take his chances of rubbing up against a case of the same disease, even if it is *called* "chicken-pox," in the railway station, the postoffice, or on the street, in another town where it has been allowed free rein under the name of chicken-pox, causing widespread infection. And besides, when a town of the former class announces the final disappearance of the disease it is immediatdly accepted and the check upon trade is at once removed.

We now turn to another aspect of the subject, and that is to the consideration of our duty in the premises.

The powers of the State Board of Health are purely advisory, and we cannot therefore compel a community to take care of its own people, that duty being delegated by the law to the local authorities, but we have the power, and it is our plain duty, to do all we can to protect the people of the State generally against a community that permits itself to become a menace to the public health. When, therefore, a town refuses or neglects to strictly quarantine under guard its own cases and suspects as well, and permits them to escape to form new *foci* of the disease in other communities, we shall feel compelled to notify the people directly and through the public prints of the fact and advise that said town be quarantined against. It is unnecessary to say that such advice would not promote the trade of that town. It is no excuse to say that there is doubt about the diagnosis, for the sanitary rule that the same precaution should be taken against doubtful cases as against unquestioned small-pox is inexorable. When, however, the disease is admitted to be small-pox, and suspects, through inexcusable carelessness or deliberately to save the town trouble and expense, are allowed to escape, utterly regardless of the welfare of other people, our duty becomes urgent.

We would dislike very much to take such action, but a conscientious regard for our duty would admit of no alternative. We hope that we may not be called upon to act.

[*From the Bulletin for April, 1900*]

ELECTION OF COUNTY SUPERINTENDENTS OF HEALTH.

We beg leave to call the attention of all boards of county commissioners to the fact that they are required by the law as amended by the General Assembly of 1897 to elect a county superintendent of health at their meeting in May. The amended law reads: "From this number (all registered physicians resident in the county) one physician shall be chosen by the board of commissioners of each county annually on the first Monday in May of each year to serve with the title of superintendent of health." We trust that this important matter will not be overlooked.

POLITICS AND SMALL-POX.

The inauguration of the political campaign brings to our mind the dangers in the matter of small-pox incident thereto, and we feel that a word of warning would not be out of place. Unusual interest in the issues involved seems to be felt, and the indications are that the meetings will be very numerous and very largely attended, and of course by all sorts and conditions of men, as they should be in a democracy.

In the past six months small-pox has prevailed in nearly half the counties of the State. The monthly reports for March show 437 cases for the month in 28 counties, and "a number of cases" in another county (for details see Review of Diseases on a subsequent page). Generally, the disease is very mild in character. Not infrequently it is so mild that the patient does not feel sick enough to go to bed, but being a little "under the weather" with what he calls, with the endorsement of some complaisant or ignorant physician, "chicken-pox," he is exactly in the right condition for visiting around among the neighbors, or loafing at the railway station, or above all, attending a gathering of any kind—political preferred. In many cases the eruption is so insignificant as not to attract attention, but nevertheless it is the genuine article, and capable of causing in the unvaccinated the most virulent and fatal form of the disease.

Again, small-pox may be spread by infected clothes. Too often it happens that the disinfection after recovery is not as thorough as it ought to be, and the poison that has attached itself to the clothing fomites remains active. It is hardly worth while to say that no unvaccinated man wedged in behind such a coat and breathing the exhalations from it would catch small-pox almost to a certainty.

The idea of the possibility of a deliberate and malicious spreading of the disease by some bitter partisan entered our mind but was immediately dismissed as absurd. We read, however, in this very morning's paper a statement of a case exactly in point, where a man had "three buggy whips worn out on him" because he refused to be vaccinated, and threatened if possible to catch small-pox and spread it among his political enemies. But be that as it may, there is no question of the danger attached to large gatherings of any kind in communities where small-pox—and especially small-pox of exceptionally mild type that is too often called chicken-pox—is prevalent or has recently prevailed. Indeed, there is danger now in all large gatherings anywhere in this section, for small-pox "bobs up serenely" in a most unexpected manner in all sorts of places. We are fairly well supplied with points of infection ourselves, but our sister States continue to re-inforce us in a most unpleasant and undesirable way, and one never knows when he may come in contact with it.

The conclusion of the whole matter is this: BE VACCINATED. That is the simplest, most certain and practically only solution of the difficulty.

REPORT OF TREASURER FOR THE TWO YEARS ENDING DECEMBER 31, 1900.

1899.		EXPENDITURES.	
Feb.	4.	Salary of Secretary-Treasurer for January	$ 83.33
March	3.	Western Union Telegraph Co., telegrams in relation to small-pox in February	8.84
		Salary of Secretary-Treasurer for February	83.33
	5.	Dr. George G. Thomas, *per diem* and expenses, small-pox investigation and called meeting of Board	40.00
		Dr. Charles J. O'Hagan, *per diem* and expenses, small-pox investigation and called meeting of Board	55.78
		Colonel A. W. Shaffer, *per diem*, called meeting March 5	4.00
	23.	Stamps for mailing Biennial Reports	25.00
		Stamps for general purposes	5.00
	27.	Stamps for mailing Biennial Reports	10.00
	31.	Dr. H. F. Long, fee and expenses as small-pox expert	60.40
April	1.	Salary of Secretary-Treasurer for March	83.33
		Office rent, first quarter	15.00
		Postage on monthly BULLETIN for two months	2.02
	4.	Postal Telegraph Co., small-pox telegrams in March,	2.84
	5.	Western Union Telegraph Co., small-pox telegrams in March	14.14
	12.	Postage on BULLETIN	1.02
	15.	E. M. Uzzell, State Printer, 500 postal cards for printed notices to Superintendents of Health	5.00
	20.	Stamps, general purposes	10.00
May	1.	Salary of Secretary-Treasurer for April	83.34
		The Sanitarian, subscription to eight copies for members of the Board	28.00
		Dr. Albert Anderson, two bacteriological analyses of Tarboro water supply	20.00
	15.	Western Union Telegraph Co., small-pox telegrams in April	6.78
	26.	Dr. Richard H. Lewis, expenses to National Conference of State and Provincial Boards of Health at Richmond, Va., May 23, 24	18.10
	26.	Dr. Albert Anderson, two bacteriological analyses of drinking water for Oxford Orphan Asylum	20.00

June	3.	Salary of Secretary-Treasurer for May	$ 83.33
	5.	Postage on Bulletin	1.24
		Western Union Telegraph Co., telegrams in May	3.30
	8.	Dr. George G. Thomas, *per diem* and expenses, annual meeting at Asheville	19.25
	10.	Dr. C. J. O'Hagan, *per diem* and expenses, annual meeting at Asheville	36.00
		Dr. Albert Anderson, one-half *per diem* and expenses, annual meeting at Asheville	13.00
		Dr. Albert Anderson, two bacteriological analyses of drinking water	20.00
	12.	Stamps	10.00
	13.	A. W. Shaffer, S. E., *per diem* and expenses, annual meeting at Asheville	37.45
	22.	Dr. Richard H. Lewis, expenses at annual meeting	22.65
	28.	Dr. Henry W. Lewis, one-half *per diem* and expenses at annual meeting and one day investigating small-pox at Morganton	29.00
		Dr. H. H. Dodson, one-half *per diem* and expenses, annual meeting	16.15
July	4.	Western Union Telegraph Co., telegrams in June,	5.96
	7.	Salary of Secretary-Treasurer for June	83.33
		Office rent, second quarter	15.00
	10.	Postage on Bulletin two months	1.61
	28.	Southern Express Co., charges on sample bucket of disinfectant	.90
August	2.	Salary of Secretary-Treasurer for July	83.33
	3.	Western Union Telegraph Co., telegrams for July	4.90
	5.	Dr. Albert Anderson, *per diem* and expenses, inspection of Eastern Hospital for the Insane	6.10
		Postage on Bulletin	.90
	22.	Dr. J. L. Nicholson, *per diem* and expenses, inspection Eastern Hospital for the Insane	24.00
	29.	L. Branson, one copy *N. C. Farmers Directory*	2.00
	31.	Stamps	10.00
Sept.	1.	Salary of Secretary-Treasurer for August	83.34
	6.	Western Union Telegraph Co., telegrams in August	1.80
	21.	Postage on Bulletin two months	1.61
Oct.	2.	Salary of Secretary-Treasurer for September	83.33
		Richard H. Lewis, expenses inspection of State institutions at Morganton	10.65
	28.	Office rent, third quarter	15.00
Nov.	3.	Salary of Secretary-Treasurer for October	83.33

Nov.	4.	Dr. George G. Thomas, *per diem* and expenses, inspection of State institutions at Morganton	$21.00
	7.	Western Union Telegraph Co., telegrams in October,	.70
	14.	Postage on BULLETIN two months	1.90
	18.	Dr. H. H. Dodson, *per diem* and expenses, Health Conference at Wilson	28.60
Dec.	6.	Dr. Richard H. Lewis, expenses Health Conference	6.90
		Dr. Richard H. Lewis, expenses trip to Goldsboro to address The Woman's Club on sanitation	3.20
		Western Union Telegraph Co., telegrams in November	2.62
		Salary of Secretary-Treasurer for November	83.33
	7.	Stamps	20.00
	14.	Dr. H. H. Dodson, *per diem* and expenses, inspection State Normal and Industrial College at Greensboro	19.86
	20.	Misses Ellington and Montgomery, typewriting in duplicate for newspapers of report of Secretary on epidemic of typhoid fever at Normal and Industrial College	12.30
	30.	Dr. J. L. Nicholson, *per diem* and expenses, Health Conference at Wilson	24.60
1900.			
Jan.	2.	Western Union Telegraph Co., telegrams in December, 1899	1.50
		Postage on BULLETIN	1.03
	6.	Salary of Secretary-Treasurer for December	83.35
		Office rent, fourth quarter of 1899	15.00
	6.	Dr. Richard H. Lewis, expenses three trips to Normal and Industrial College	20.95
		Dr. Richard H. Lewis, expenses inspection convict camp at Castle Hayne	11.85
		Dr. Henry W. Lewis, *per diem* and expenses Health Conference at Wilson	19.00
	9.	Subscriptions to eight copies of *The Sanitarian* for members of the Board	28.10
	24.	Dr. George G. Thomas, *per diem* and expenses inspection of convict camp at Castle Hayne	6.00
		A. W. Shaffer, S. E., *per diem* and expenses inspections of Normal and Industrial College, both A. and M. Colleges and Central Hospital for the Insane	69.30
Feb.	2.	Western Union Telegraph Co., telegrams in January	6 62

Feb.	2.	Dodson Printers' Supply Co., one Horton mailer	$ 20.00
	3.	Salary of Secretary-Treasurer for January	83.33
	5.	Postage on BULLETIN	1.17
	22.	Thomas Whitaker, publisher, one copy Microscopy of Drinking Water	3.50
		Dr. George G. Thomas, *per diem* and expenses, inspection of State University	10.75
		Dr. Richard H. Lewis, expenses two trips to the University, inspection and small-pox	7.05
March	1.	Salary of Secretary-Treasurer for February	83.33
	5.	Western Union Telegraph Co., telegrams in February	2.31
	16.	Stamps	15.00
	20.	Dr. Richard H. Lewis, expenses Pure Food and Drug Congress at Washington	32.05
April	3.	Western Union Telegraph Co., telegrams in March,	4.17
	12.	Office rent, first quarter of 1900	15.00
		Salary of Secretary-Treasurer for March	83.34
	18.	Postage on BULLETIN three months	2.63
May	1.	Salary of Secretary-Treasurer for April	83.33
		Southern Express Co., charges on Pennsylvania Reports, two volumes, to members of Board	2.80
		Dr. Albert Anderson, one bacteriological analysis for Oxford Orphan Asylum	10.00
	4.	Western Union Telegraph Co., telegrams in April	1.79
	9.	Dr. J. A. Egan, Treasurer, annual dues of Board to National Conference of State and Provincial Boards of Health	10.00
	15.	A. Williams & Co., account from January 31, 1899, to May 1, 1900, sundry small items as per vouchers	5.15
June	7.	Postal Telegraph-Cable Co., telegrams	.80
	8.	Salary of Secretary-Treasurer for May	83.33
		Dr. Richard H. Lewis, expenses annual meeting State and Provincial Boards of Health at Atlantic City	42.25
		Western Union Telegraph Co., telegrams in May	2.19
	13.	Dr. H. H. Dodson, *per diem* and expenses, annual meeting of Board at Tarboro, May 22-23	26.85
		Dr. Albert Anderson, expenses National Conference State and Provincial Boards of Health at Atlantic City	42.65
		Dr. Richard H. Lewis, expenses annual meeting at Tarboro	10.50
	15.	Stamps	10.00

June	16.	Dr. Henry W. Lewis, *per diem* and expenses, annual meeting	$ 16.00
	27.	Dr. J. L. Nicholson, *per diem* and expenses, annual meeting	22.35
		Postage on Bulletin two months	1.72
July	6.	Salary of Secretary-Treasurer for June	83.33
		Office rent, second quarter	15.00
	10.	E. M. Uzzell, State Printer, 500 postal cards for notices to Superintendents of Health	5.00
	16.	Postage on Bulletin	1.49
	19.	A. W. Shaffer, S. E., *per diem* and expenses, annual meeting Normal and Industrial College and Central Hospital	36.48
Aug.	23.	Salary of Secretary-Treasurer for July	83.33
Sept.	1.	Salary of Secretary-Treasurer for August	83.34
	4.	Western Union Telegraph Co., telegrams in August,	1.08
Oct.	1.	Postage on Bulletin two months	1.84
		T. F. Brockwell, repairing typewriter	1.50
	2.	Salary of Secretary-Treasurer for September	83.33
		Office rent, third quarter	15.00
	26.	Postal Telegraph-Cable Co., one telegram	.25
Nov.	2.	Dr. Richard H. Lewis, expenses trip to Normal and Industrial College	6.80
		Salary of Secretary-Treasurer for October	83.33
	22.	Stamps	15.00
Dec.	5.	Salary of Secretary-Treasurer for November	83.34
	10.	A. W. Shaffer, S. E., *per diem* and expenses, biennial inspection of public water supplies at Asheville, Charlotte, Concord, Durham, Fayetteville, Gastonia, Goldsboro, Greensboro, Henderson, Lumberton, Monroe, New Bern, Raleigh, Reidsville, Rocky Mount, Salem, Salisbury, Sanford, Statesville, Tarboro, Wadesboro, Wilmington, Wilson and Winston—24	208.52
	12.	Postage on Bulletin three months	3.18
	14.	E. M. Uzzell, State Printer, 500 postal cards, notices to County Superintendents of Health	5.00
	18.	Dr. H. D. Holton, Treasurer American Public Health Association, transactions for two years	10.00
	19.	Dr. Albert Anderson, thirteen bacteriological analyses of water supplies	130.00
		Dr. W. T. Pate, twelve bacteriological analyses of water supplies	120.00
	27.	The McMillan Co., subscription to *Journal of Hygiene* for 1901	3.75

Dec.	31.	Southern Express Co., charges on 100 copies *Disinfection and Disinfectants*	$2.25
		Office rent, fourth quarter	15.00
		Salary of Secretary-Treasurer for December	83.34
		A. W. Shaffer, S. E., *per diem* and expenses, inspection of School for Deaf and Dumb and the Blind at Raleigh and State farms in Halifax	37.30
		Trade Periodical Co., 100 copies of *Disinfection and Disinfectants* for County Superintendents of Health	66.67
		Drayage on BULLETIN to post-office, 24 months at 15 cents	3.60
		Balance on hand December 31, 1900	64.59
			4,004.81

RECEIPTS.

Balance on hand January 1, 1899	69.40
Appropriation by State for 1899	2,000.00
Appropriation by State for 1900	2,000.00

APPENDIX.

THE STATE'S HEALTH LAWS.

READ BY HENRY W. LEWIS, M. D., OF JACKSON, AT THE WILSON HEALTH CONFERENCE.

In an address before the State Medical Society of New York, delivered in February of this year, Dr. William Osler made use of the following language:

"This is a nation of contradictions and paradoxes. A clean people, by whom personal hygiene is carefully cultivated, displays in public sanitation a carelessness which is simply criminal."

Again he says: "This is God's own country, with man's own back yards and the devil's own cess-pools." Such words from so eminent authority as Dr. Osler should bid us pause and ask how these fearful conditions may be altered, for here in Eastern North Carolina it is an open secret that preventable disease is always with us. Why is this so?

Is it because we have no health laws or health officers? Let us see.

In chapter 214, section 5, of the Laws of North Carolina for 1893, entitled "An act relating to the Board of Health," we find: "The board of county commissioners in every county in this State are required to elect on the first Monday in May of each year a physician to serve as health officer."

This law is mandatory, and should the commissioners fail to elect a health officer, as therein provided, they would be guilty of a misdemeanor and subject to fine.

The duties of this health officer are prescribed by the law and he is known as superintendent of public health; he is the supreme authority in his county in matters pertaining to public health, his jurisdiction extending to incorporated towns having no health officer. Inland quarantine is under his control, and the law gives him the power to condemn nuisances dangerous to public and private health and to cause the same to be removed under penalty. He has also to make monthly reports to the Secretary of the State Board of Health and to the county commissioners.

This law, as I have said, is mandatory as to the election of the superintendent of public health and his duties, but in sections 24 and 25 it throws wide the door for the advancement and protection of public and private health, giving full power in that regard to the authorities of county, city and town.

Section 24 provides that the county commissioners and magistrates are authorized to meet at any time and levy a special tax to be expended for the preservation of the public health under the direction of the chairman of the county commissioners, the mayor of the county town and superintendent of public health.

I will quote section 25 in full:

"The authorities of any city or town are hereby authorized, not already authorized in its charter, to make such regulations, pay such fees and salaries and impose such penalties as in their judgment may be necessary for the protection and advancement of the public health."

This law contains many other *most useful and necessary provisions* which the time at my disposal does not allow me to mention.

The people should read and study it, as it was passed for their benefit. I doubt if any other State has a better health law; it is a wide and broad law and has served us well during the present year in stamping out a threatened epidemic of small-pox.

With it we can meet any emergency which may arise, institute sanitary reforms and enforce sanitary regulations; yet, what are we doing in our towns and homes to avoid preventable disease? Very little, if anything.

The people are waiting quietly and patiently for some widespread epidemic of a fatal nature to make its advent among them, for it seems that disease *must be followed by death, aye, many deaths*, in this, our country, to arouse us to the importance of proper sanitation.

It has been said that great epidemics are the only great reformers. We seem to be waiting for some such visitation, while unmolested lie man's own back yard and the devil's own cess-pools, in which lurk the germs of "the pestilence that walketh in the night time." The destruction which wasteth in the noonday, claiming every year their victims, cutting off some bright and promising youth in the spring-time of life, or, *saddest of all*, some lovely maiden with the first blush of womanhood upon her cheek.

Throughout all this land, in country and town, there is sickness (preventable sickness) during the summer and autumn months. And why? Simply because *we will not be clean*, because we pay no attention to ordinary sanitary laws.

Osler says: "The responsibility for the widespread prevalence of disease rests directly *upon the wanton carelessness of the people.*" This is hard language, but it is true.

Let me ask again, what are we doing here in North Carolina with our excellent health law? Many do not know that there is such a law on our statute books. What are we doing with our local health officer, who, beyond his duties at jail and poor-house and the occasional examination of a lunatic, perhaps, does nothing for the advancement of public and private health? He rests in inoccuous desuetude. And why?

Our people don't want anything done. They make no demands upon the law or the health officer for the improvement of public or private health, and if by chance he should get after one of these venerable back yards they become angry; they make a personal matter of it. I have known physicians to lose patrons by doing duty as health officers. I have lost them myself.

Why this unwillingness to have the health officer inspect our premises? It is not because he is incompetent. It is not because he does not do good work.

Go into the county homes in this State, go into the jails and note the great changes and improvements over the old unsanitary conditions. Here he has full power to enforce sanitary measures and regulations. Here he is held responsible.

Look at his work during the late small-pox outbreak and you will find it good. Why? Because the people were awakened to a sense of danger, the health law was invoked and the health officer allowed to do his duty.

The State Board of Health hopes and believes that the unwillingness of the people of North Carolina to take advantage of their opportunities for better sanitation is due to the fact that they need to be enlightened concerning them, hence this conference here to-night.

Allow me to say a few words about our local health officers. Having been superintendent of public health in my county since 1885 and health officer of my town for the past year, I think I am somewhat qualified to speak about them, their joys and their sorrows. He is not always elected on his merits, but sometimes because he has a pull with the powers that be, and again because no one else will have the office. This is not as it should be. None but *competent and active men* should fill this important position.

The general public hold the local health officer in small esteem, many regard him as a mild kind of nuisance and think the small salary he receives is so much money thrown away. Let some dangerous, infectious or contagious disease establish itself among us, then he becomes a man of importance—the suggestions he receives would fill a volume—every one seems anxious to impress upon him that the whole responsibility *rests entirely upon his shoulders.* Yet, few will lend a helping hand to stamp out a threatened epidemic, many preferring to run away, returning when the work has been accomplished and danger over, *to kick* at the bills the town or county has to pay for the *preservation of its health, trade and reputation.*

The public seem to estimate the cost of disease by the amount of the doctor's bill. I need not say that they do not represent one-tenth of the cost of sickness, besides these bills are sometimes like a bill presented by a friend of mine to an old gentleman in Northampton county. The bill read: "Mr. Smith to Dr. Jones. To six visits, $12; to medicine furnished, 50 cents." Mr. Smith pulled out fifty cents and said: "Here, Doctor, I want to pay you for your medicine, and I will return your visits."

I hope no one in Wilson returns his doctor's visits. To my mind that would be a kind of social function, more honored in the breech than the observance.

The efforts of the health officer in stamping out disease are sometimes actively resisted. A favorite excuse for this is to question his diagnosis. Assistance is often given by some broken-down or an irregular physician who, in most instances, has never seen the case in question, but gives it as his opinion that the disease is not what the health officer pronounces it to be.

I know of nothing more dangerous to the health of a community than this. Such men usually find ready listeners. The usefulness of the health officer is impaired; his efforts at sanitation and disinfection seriously endangered.

The State Board of Health had some of *these wise doctors* to contend against during the present year (it's a comfort to know that ninety-nine per cent. of them were wrong), making it necessary to employ an inspector to diagnose small-pox.

A very aggravated case of this kind came under my notice during the past summer. Small-pox made its appearance in a small Virginia town near our border line, the local health officer very promptly recognized it. A certain physician in the town said it was not small-pox and pronounced as absurd all measures taken for the protection of the community.

A member of the Virginia State Board of Health was called. He said it was small-pox. Still the doctor contended it was not. A United States Marine Hospital expert was summoned. He agreed that it was small-pox. Yet the contending doctor held out until, alas, commencing with negroes, it invaded the homes of the white people. The sheriff of the county had it in his family. In all they had about sixty cases and it extended to the adjacent county, a distance of about twenty miles.

So you see that not only the laity *but sometimes doctors* contribute to the unhappiness of the health officer. The *public should demand* that when an honest difference of opinion exists as to diagnosis, two or more physicians having seen the patient, that *an expert be called at once*, whose opinion shall be taken as final, in the meanwhile *every precaution used* to prevent the disease from spreading.

Where a doctor ventures an opinion without seeing the case in question *he should be utterly ignored and disregarded.*

However, I have neither time or inclination to enlarge upon the sins of the doctors. The object of this meeting is to try and sow the seeds of sanitary reform broadcast among you, and the appearance of this audience gives promise that they may fall upon fruitful soil.

To-day we stand upon the very threshold of the twentieth century. This great Southland has already awakened from its Rip Van Winkle slumbers, and we are manufacturing our own products successfully and in profitable competition with the North. The future opens bright before us. *We have a great country; a great people* are laboring earnestly for its educational, commercial and agricultural upbuilding. What are they doing for its healthfulness?

Are we taking the proper measures to avoid all preventable disease, or is this, as Osler says, "God's own country, with man's own back yard and the devil's own cess-pool?" My friends, I fear the above quotation about expresses the existing conditions in Eastern North Carolina.

Why not alter the conditions? Why not be clean? Have you a health law? *A most ample one.* Have you health officers? The law provides you with them. Then what is wanting? Only this, *that our people should awaken to the importance of sanitation*—use the health law and the health officer. Both were created for their benefit—*both are waiting* to be used.

This rapidly growing, beautiful town (with factories building and factories built and operating) has a great future. Will you make it healthy? Will you make it clean, not only as to its public places, but the *back yards as well.* We believe that you will. We hope that you have the good of this town at heart.

We have no knowledge of your sanitary surroundings, but will make bold to say they can be improved. In order to improve them the first thing you have to do is to take your hands off your pocket books.

A town which is humping itself like Wilson needs to pay some taxes and spend some money for its health.

Every householder should attend to the cleanliness of his premises; every house-wife attend to the sanitation of her dwelling. In short, you must be more or less your own physician, in a sanitary sense, and you will have to spend a little money to get your premises clean and keep them clean. Your health officer will tell you how to do it. Let me ask, do you pay him a reasonable salary, because his work will be most disagreeable and onerous, and it is not in mortal man to serve faithfully in the affairs of this world without compensation. You want good work, so make the office worth something and you will get it.

A health officer, when he goes to work cleaning out a town, has no easy time if he is an active practitioner of medicine. He perchance may lose a few patrons by doing his duty, for a very curious thing happens when you invade a man's back yard. They become blind to the conditions which exist there; even their olfactories refuse to recognize the unwholesome odors. They flatter themselves that they live in the utmost cleanliness, but they are quick to recognize and complain of their neighbors, especially if there is some preventable malady existing in the neighborhood. Such people are apt to indulge *in kicking and abuse.* The health officer will certainly run against more or less of this kind of thing, but those among you who are determined to have a clean town and keep it clean will uphold him in doing his duty and see that he loses nothing by it.

I will draw on my experience and tell you of an instance which illustrates this kicking propensity when the health officer gets in his work. Several years ago a certain village in Northampton county was afflicted with epidemic dysentery. So violent was the type of disease that many died of it; indeed, some one telegraphed to Raleigh that they had cholera there. I was summoned by a petition signed by twelve citizens to come down, make an inspection of the town and recommend measures for its sanitation.

I went. I condemned everything I could find in the way of a nuisance, including the back yards of those who signed the petition. I became immensely unpopular. They spoke of hanging me in effigy, but the disease kept claiming its victims. Even the drummers stopped coming. So they took my advice, cleaned up and drained. To this day they have been free from dysentery.

Now, I have said you must be your own physician in sanitary matters so far as your households are concerned. We know by experience who is boss in this department.

Mr. President, if we could only get the ladies to take hold of sanitation in North Carolina something would be accomplished. We are all married men, sir, some distance from home, but it is an inspiring sight to see such a gathering of beauty and loveliness as greets us here to-night to lend its presence to the cause of sanitation.

Let me entreat you, fair dames, to carry this matter home to the men. Then must it follow, as the night the day, that there will be sanitation in Wilson.

The most practical way to commence work is to clean up, under the advice of the health officer or the family physician. Let every one sweep before his own door. It has been said no one can improve himself without improving others. Your neighbor may follow suit, and so it may go on down the line. If you find an obstinate man in the way *complain of him.* The authorities will know what to do. This health law I have been telling you about makes provision for him. If he is not able to stand the expense of cleaning the premises the nuisance can be removed at the expense of the town, provided the cost is not more than one hundred dollars.

Remember always that eternal vigilance as to the minutest detail of household and back yard cleanliness, keeping the soil clean, the water supply unpolluted, is the price of health.

Never use an open well. Always have them driven (the deeper the better), for if anything has been demonstrated in Eastern Carolina it is that the old-fashioned well, two or three feet in diameter, was a most fruitful source of danger.

If there is an undrained place on or near your premises which holds even a little water, drain it, for mosquitoes breed in such places, and we now know that they inoculate us with the parasites of malaria, and we should sleep under nets in summer to protect us from these pests.

With wire gauze keep all insects out of the house. The common house fly has been shown to carry the germ of typhoid fever and other diseases upon his legs and wings. Trim up the shade trees, cut down the weeds, remove all superfluous shrubbery, let in the sun-light and let the soil dry. Make permanent provision for removing at regular intervals everything which has even a suspicion of uncleanliness about it. Keep on hand some good reliable disinfectant to use upon the sites where such removal has taken place.

I will not prolong these suggestions. You have your physician and your health officer. They will gladly advise you what to do if you apply to them.

Now, when you have gone to work in a cheerful, hearty manner, and have cleaned up the premises, making permanent provision for keeping them clean without the health officer having to do disagreeable things to you, before the mayor or somebody else, how you will boast (I expect you brag some now) that Wilson is the cleanest, healthiest, most progressive town in the State.

Mr. President, those of us who are growing gray in the practice of our profession begin to think that we have not lived in vain.

We have seen the standard of medical education advanced in North Carolina, until now the license of the State board of examiners is a guarantee of competency.

We have seen theory and speculation as to the cause of disease replaced by accurate scientific demonstration. We have watched the evolution of the germ theory until now nearly every disease can be diagnosed with the microscope.

We have seen the surgeon, whose methods are aseptic (absolutely cleanly) invade with impunity all the vital cavities of the body. We have seen the wonderful Xray reveal to the eye our bones and internal organs. We know that we have not been idle as to improved methods in the treatment of disease. Diphtheria has been robbed of its fearful mortality by the use of antitoxin; the death rate in typhoid fever greatly reduced by the employment of the cold bath. We now know that vaccination practiced at regular intervals for several generations would eradicate small-pox from the human family.

In a hundred different ways we have come to a better understanding of disease and its treatment. *But all these great advances* are as nothing before the triumphs of sanitary science in the prevention of disease.

Cholera and typhoid fever have been swept away. Yellow fever can be restricted and stamped out. (See the results at Hampton, Va., during the past summer).

We have learned to fight tuberculosis and diphtheria with some measure of success, and with what weapon? By what means can these results be accomplished?

The answer is brief. By cleanliness, pure water and a clean soil, cleanliness of person, of household and back yard.

The surgeon who to-day would disregard the lessons of asepsis (cleanliness) in his book could be prosecuted for malpractice, yet the citizen can sacrifice his own and his neighbor's loved one on the altar of ignorance and go unscathed.

The negligence of even one man is capable of creating an epidemic.

A notorious example of this occurred at Plymouth, Pa., in 1885, when one case of typhoid fever, on the water-shed of the stream from which the town obtained its drinking water, caused twelve hundred people to have the disease.

Mr. Pressdent, what does it profit us to have Leonard Wood clean out Santiago de Cuba? What good does it do to have George Waring lay down his noble and useful life, a martyr to enforcing sanitary regulations in Havana, when here in North Carolina, with the rays of the nineteenth century's boasted civilization shining full upon us, we neglect the very measures we presume to teach others, and that, too, with excellent health laws and competent health officers?

Let us hope that the time is near at hand when the people of this great and noble State will awaken to the importance of both public and private sanitation, will learn to use this law and the health officer; not because some great epidemic has shown them the necessity for such action, but because their own good sense tells them it is wise—it is in line of progress to do it.

Now, one word to the mayor and aldermen of this town and I am done.

To them I would say that the State Board of Health is preaching to-night as best as it can from the old Latin text: *Salus populi suprema est lex*, and as such, it should be enforced *without fear and without favor.*

We entreat you to use the power the health law of your State gives you, and to use it wisely.

VACCINATION AS AN ECONOMIC MEASURE.

READ BY HENRY H. DODSON, M. D., MILTON, N. C., AT THE WILSON HEALTH CONFERENCE.

I desire to discuss with you a subject of which you have heard very much in the past few months—small-pox and the means of prevention.

Small-pox has been in many parts of the country for more than a year and is now and will continue to be until a more effective remedy is used.

What does small-pox do in a community? Leaving out the question of its being a dread epidemic and a loathsome disease, that is, the illness *per se*, it interrupts business and trade, it closes your schools, public and private, and it has interfered with the courts, causing their postponement, thus entailing an additional expense on the county by detention of criminals in the jails, and it even closes your churches.

In some country districts, and, in several instances in my knowledge, farming operations were stopped. It interferes with everything.

You are a branded community—cut off and quarantined from the outside world.

Therefore, small-pox is an enemy to life, health, trade, agriculture, education, law, religion and society in general.

What is the effective remedy? Not general quarantine and hospitals and pest-houses, but *vaccination*. Of this you have heard a great deal, and I do not care to discuss with you vaccination as the greatest and most beneficent discovery of any age, preventing with absolute certainty, as it does, this dread disease, and saving thousands of lives, for this is a settled fact. But I wish to present vaccination in a new phase—as an economic measure; how a city, community, the tax-payers, can save money.

I can explain to you in a few words, by a most striking illustration, a case in point. In February of this year a man came to Pittsylvania county, Virginia (about three-quarters of a mile from Milton, the town in which I live), from Newport News, and in a few days broke out with genuine small-pox. The entire family of six or seven children contracted the disease. The parents had been vaccinated, and escaped. The authorities took no notice, saying it was chicken-pox. The neighbors all came in to see this interesting case of chicken-pox, and this was not enough, but they had a grand wedding in the family, and many guests were invited. Then they had CHICKEN-POX a plenty! On one farm I saw twenty-three cases of small-pox, and all farming operations stopped. At one time they had only two hands to carry on the work of the farm at a very busy season, entailing great loss to the owner of the land. Still no vaccination except what I myself did privately. One very reliable man told me that he lost five hundred dollars by his inability to send around his thresher to thresh the wheat for the people.

This state of affairs continued until about June or July when, from this focus of infection, the disease got into the city of Danville, about ten miles away. Then, and not until then, did the county authorities begin to take notice of it and use means to stop it. What did they do? Use this great economic measure? No. They built a pest-house, employed physicians, guards, nurses, and isolated the sick—all necessary when small-pox comes, but expensive. Suppressing the small-pox has cost this one township in Pittsylvania county, Virginia, more than three thousand dollars. The people could have been vaccinated for six hundred dollars, giving them protection for a number of years, whereas they have since had other cases of small-pox from a new focus and may continue to have them until they use the proper preventive—vaccination.

Not only the township but a rich county may be bankrupt if this continues. Realizing our own danger from the first, not only for my town, which is immediately on the Pittsylvania line and only three-quarters of a mile from these first cases, but for the county of Caswell, which is contiguous to Pittsylvania for several miles, I brought the matter to the notice of our town council and the people were vaccinated.

Notwithstanding the small-pox has been at our doors for months, we have had no case of small-pox in the town of Milton for thirty-three years.

I also presented the danger to the county commissioners and vaccinated all persons along the Pittsylvania line, and it has borne fruit, as I will show. The result was, that notwithstanding the people were side by side, we only had six cases of small-pox, and they infected before the general vaccination—with the appalling cost of not more than one hundred dollars.

What is more convincing than these practical facts and plain figures? It is your duty—the people's—to take advantage of this cheap and innocent preventive of small-pox. It is the duty of the authorities of every town and the commissioners of every county in the State, they being the guardians of the people's moneys, to give to the people this economic and only preventive against small-pox. The time will come when the intelligence of a community will not be judged alone by the number of schools and churches, by education and morals, but also by their promptness in taking advantage of preventive medicine and pre-eminently—vaccination.

OLD AGE AND HOW TO ATTAIN IT.

READ BY DR. J. L. NICHOLSON, OF RICHLANDS, AT THE WILSON HEALTH CONFERENCE.

We find that even in those remote days while yet the pensive light of pastoral simplicity bathed the brow of primitive man, the great enigma of life was looked upon with reverential eyes. This reverence, with the gradual development of man, created those profound thoughts and idealistic conceptions which signalized the sublime efforts of those illustrious lights who adorned Chaldeu, and whose tenets in succeeding generations inspired the Cabalist, the Alchemist, and latterly the Rosicrucian to untiring efforts to reveal to man that hidden panacea immortalized by the pen of the poet and the lay of the minstrel. Even in our material and unpoetic age the uncertainty of life calls forth the varied phases of latent thought and philosophic speculation, engendering in our minds inexpressible yearnings to pierce the mystic veil of the occult. Consequently physical science is a study of universal as well as individual interest, and its pre-eminence can be no better exemplified than by being accepted as the most salient subject harbored in the mind of man. Guided by these ambitions, it is natural for the human family to aspire to that sphere of knowledge whereby they can prolong as well as preserve their precious heritage from the ravages of remorseless time. This is illustrated by the fact that even within a decade the world of science was startled by the announcement of Brown-Sequard that even wrinkled old age could again, through human instrumentality be restored to normal vigor; and that the secret involving a long and healthy life lay in the proper and systematic sub-cutaneous injection of a certain extract derived from the *lamb*. Yet more recently we hear another voice pronouncing *goat lymph* as being the genuine elixir for perpetual youth. However, even if it were possible of attainment, it would be a question whether an indefinitely prolonged life would be desirable, surely only if accompanied by unimpaired health of body and mind. Even then it would to a large extent interfere with economics unless the increase of population could correspondingly be limited in direct ratio to the increase of years. The human family are at present unfortunately too prone to disobedience to attain any great and envied age. The laws of nature are inexorable, and bear witness that vigorous and healthy life is the reward only of untiring vigilance, the prize of a constant struggle with the combined powers and forces which beset the human pathway and threaten the extinction of our race. If for a time, even in the prime of life, these adverse influences appear to be dormant, we may be assured that they are lurking within the shades of a conscious security, eagerly watching for any violation or neglect of sanitary law to sow the seeds of heavy punishment.

While the preservation of health is the prime concern of every man, yet how few enjoy uninterrupted health, how few reach the period of life allotted them by nature's laws! Statistics prove to us that scarcely one sixteenth attain the full term of life, while it is lamentable to note that ninety-five per cent. meet a premature death. The census of 1890 demonstrates that less than one and one-half per cent. of the people of the United States barely reached the age of seventy and only three-fourths of one per cent. attained the age of eighty. We are further informed that quite one-fifth of all premature deaths occur in infancy, that two-fifths occur by the time the fifth year of life is completed, and that the remaining three-fifths are almost equally distributed in the intervening space between childhood and old age.

We naturally ask ourselves the question, what are the causes superinducing these sad and untimely sacrifices of life?

Why is it that so few enjoy the length of years promised us by that wise Being whose beneficent hand is ever ready to assist us, and who is ever willing to fulfill His part of the sacred covenant? The unhygienic influences of modern environments incident to dwelling in densely populated centers and crowded communities, unhealthy occupations, the ever-increasing struggle for daily maintenance, and the growing burden of mental taxation are important factors in decreasing the natural resistance to disease, and afford in a general way, at least, a partial answer to the question.

The foremost cause of premature death, the one that stands forth most pre-eminent in the ranks of earthly perils is undoubtedly tuberculosis—the "consumption" of popular language. "This is a disease," says Dr. Keen, "which has claimed more victims than all the wars and all the plagues and scourges of the human race. Even since the few short years since Koch's discovery (of its special germ in 1882) over two million persons on this continent have succumbed to its fatal infection. The annual tribute of the United States to this scourge is over one hundred thousand of its inhabitants. Each year the world yields up 1,095,000, each day 300, each hour 12 of its people as a sacrifice to this plague. Of the 70,000,000 individuals now peopling these United States 10,000,000 must inevitably die of this disease if the present ratio is kept up." This cruel scourge that wreaks its slow, sad havoc among men, bereaving the world of very nearly one seventh of her people, may never be cured with any degree of certainty. Yet it is a fact of the highest importance it can be absolutely prevented. This knowledge is now vested in man, who has found that it is no longer a family disease, much less a local disease, but an infectious one, and therefore preventable, and that its specific germ is a low class of plant life, thriving best upon animal tissue and under a temperature near that of the normal human body. In every instance the infecting germs have been received from a previous case, and that almost entirely by and through the means of the expectoration. So numerous are these germs in a person moderately advanced in consumption, that he will expectorate, we are informed, from one to five billion of them daily. With these innumerable seeds so incautiously scattered in the home, as well as by the wayside, is it surprising that a few should survive and find lodgment in the system of an unsuspecting member of such a family, or even a neighbor? The consumptive's sputum once dry and pulverized, yet loaded with living germs, floats through the air as dust, and when inhaled by another whose physical condition affords a congenial soil for its growth, will invariably produce consumption. The patient, through his weary months and years of suffering, is thus a constant menace to those about him, for should your resisting powers to this poison fall below par, from any cause, you will likewise fall a victim to this sad and fatal malady. The sputum in liquid mass is, however, not a means of conveyance. Flügge has very recently shown us that the spray or minute droplets which are expelled during a siege of severe coughing by consumptive patients play a certain role in the spread of the disease, however.

There are two methods of suppressing or preventing the propagation of this malady—private and public. First, if it were possible to destroy all expectorations, and avoid, or thoroughly cook all tubercular food products, the problem would in a very large degree be solved. All preventive measures must have for their object the complete disinfection or destruction by fire of all tuberculous discharges while in the liquid state, so that the food we eat, the water we drink, and the air we breathe will thereby not become contaminated. Following this, all sputum must be collected in a proper vessel and destroyed. A suitable pocket flask for out-door patients has been provided which is quite a salient feature in the list of precautions, as well as the holding of a handkerchief to the mouth during an attack of coughing. Many domestic animals, especially the cow, are susceptible to this disease. There is scarcely a doubt that the heavy mortality in early childhood from tuberculous affections is due to the use of unsterilized milk from the tuberculous cow, for congenital tuberculosis is so rare that it hardly can be termed a factor in the production of these cases. A great peril confronts humanity the world over in the existence of widespread bovine tuberculosis. We learn this from competent investigators who are uniform in their statements that quite twenty-five per cent. of the milk cows are affected with this complaint. In proof of this, the scientific examination recently made comprising sixteen dairies showed that the milk of nine possessed the germs of tuberculosis. This evil could be well-nigh eradicated if proper State and municipal regulations were made and enforced, both with reference to the milk supply and the sputa of the sick. As to the former the only correct solution is to suppress the sale or use of any milk that is not certified to by proper authority as being derived from cows known to be free from tuberculosis.

The question of homes or hospitals in a suitable climate for the isolation and treatment of these patients is one now receiving much attention. The results thus far have been highly gratifying. Leprosy has been practically effaced from civilization by this method of segregation, and while humanity looks upon this disease in twofold horror, yet they will associate, eat, drink and sleep with consumptives, regardless of the fact that tuberculosis is tenfold more contagious. Through the method of quarantine, yellow fever, Asiatic cholera and other infectious diseases have been shorn of their horrors and no longer "gather their rich harvest of death."

In a paper of this character it would be unwise and impractical to attempt to trace in detail the almost innumerable diseases which afflict humanity and work to the prevention of long life. For convenience, however, they can with few exceptions be placed in two classes. Those due to vegetable or animal parasites, and those produced by chemical causes. Under the former we find the eruptive, contagious or infectious fevers, such as measles, scarlatina; small-pox, typhus, typhoid, diphtheria, tuberculosis, and malaria, itch, favus, etc.

Under the latter, through chemical causes like alcohol, lead, nicotine and other extrinsic poisons, as well as those arising from poisons that are produced within the economy either as the result of normal or abnormal chemic activity with insufficient elimination, such as gout, rheumatism, headache, chlorosis, albuminuria, uremia, asthma, etc.

With these many varied evils foreshadowing our pilprimage, the supreme hope for a long life and suffering humanity is in preventive medicine. Statistics showing the gradually increasing success of the blood serum therapy and sanitary precautions go to prove that by proper management the greater number of human ailments may be entirely prevented. The principles of blood serum therapy were first applied in medicine by employing vaccination in the prevention of small-pox by Jenner more than a century ago, yet they were not at all understood scientifically until Pasteur a few years ago made his renowned discoveries concerning the protective inoculation of animals. Behring's law establishes the fact that "The blood and blood serum of an individual which has been artificially rendered immune against a certain infectious disease, may be transferred into another individual with the effect to render the latter also immune, no matter how susceptible this animal is to the disease in question." Our knowledge concerning these antitoxins is as yet somewhat vague and limited, and while unfortunately we cannot clearly discern the intricacies attending their creation, yet our recent experiments in themselves bear conclusive evidence of their inestimable value in the cure and prevention of many human diseases. Their use is steadily guiding us toward a true science of therapeutics and to the solution of some of the deepest mysteries of life, health and disease whereby we may ultimately prevent premature death and fully realize those cherished aspirations for a long and vigorous life. We are not overzealous when we assert that the results of the antitoxin treatment, as thus far inaugurated, leave no space to doubt or contend its final life-giving powers to our race. To say nothing of its specific powers in the treatment of tetanus, snake-bite, erysipelas, hydrophobia and some other affections, the results obtained in relieving that most dreaded of all the diseases of childhood, diphtheria, gives a slight idea of its wonderful value. Through its use in this disease scarcely five patients succumb out of every one hundred, when without it not less than thirty in the same proportion prove fatal. With our improved knowledge of to-day as to the cause of infectious diseases we are enabled to rescue thousands from an untimely grave, and the future in this direction is of such portentous interest that it is impelling medical science to its most intense activity. Statistics corroborate our statements with reference to the promotion of longevity, and from them we note that twenty of our principal cities, with a population of 7,500,000, establish the fact that since 1838 the mortality from small-pox has been reduced thirty-six per cent.; that of typhus fever since 1881, ninety-five per cent.; that of typhoid fever sixty per cent., ranging from the same date, and from 1860 we find the decrease in scarlet fever reaching eighty-one per cent., and tuberculosis forty-six per cent. We can safely flatter ourselves, with sincerity and truth, that the war now being unceasingly waged against disease and the foul conditions which foster it will preserve more lives than all the wars in the mystic future will destroy.

Sanitation, like charity, "should begin at home." Cleanliness, systematic care and industry have been truthfully defined as being the chief characteristics of scientific house-keeping. Every relation that woman may bear to society, be it wife, mother, house-keeper, cook or nurse, impels her to be a true sanitarian. Whether our womanhood realize it or not, it is unmistakably true that they are largely responsible for a great deal of the sickness and debility in their homes. Not only so, but the thoroughly efficient sanitary condition of the city, town or village depends in a high degree upon the habits of cleanliness practiced in the individual home, and with an increased knowledge of sanitary science, and an intelligent application of its principles, the home will not only be greatly improved, but life will be appreciably lengthened.

Let our minds now rest upon the question of old age, its attendant conditions and necessary inconveniences. It goes without saying that if our declining years mean naught but ever-increasing discomfort and physical suffering they are but additional burdens, and bring with them nothing to be desired. Premature old age unmistakably indicates that the person thus burdened, or his ancestors, it may be even to the third or fourth generation, have sinned against their physical welfare, and are but reaping the reward of their transgressions.

A theory of old age recently advanced by Metchnikoff, the eminent geologist and bacteriologist, asserts that the organs of the body are composed of two kinds of cells, the *common cells* and the *noble cells*. That the noble cells are adapted to the special function of the organ of which they form a part, while the common cells are purely connective, holding together the noble cells. Between these two kinds of cells there is a continual conflict, and while the noble cells are stronger and successfully resist, we have mental and physical vigor. Yet eventually the contest exhausts them, and the preponderance passes to the common cells; this signalizes the beginning of old age. Now, while the noble cells are crowded more and more, the common ones are growing in size at their expense and interfering with the functions of the organ, hence the abnormal, diseased appearance of the organs and the increasing difficulties in the way of living. In view of this, ultimately the performance of the functions becomes impossible, and we have death. The professor suggests that it is within the range of possibility to prevent this encroachment of one cell upon the other by inoculation, or some other process, and thereby preserve the equilibrium between the cells and protect old age from its infirmities. This is but another way of asserting that nutrition equal to the expenditure would prolong life, a proposition in every way true.

It is generally conceded that the chief cause of senile failure is to be found in defective circulation, the nutrition of the brain, the nervous system, and indeed the whole body suffering from the incapacity of the heart and the rigidity and narrowing of the blood vessels through atheromatous and other allied conditions. This is seen in the lazy and torpid circulating movements of aged people, so painful in contrast to the bounding pulses of vigorous youth, and readily accounts for the coldness of their hands, feet and limbs, and their failure in physical and intellectual vigor. Clinical observation has long since shown that calcareous or chalky degeneration of the arteries is a common and serious factor in the causation of this insufficient circulation in advanced life. "Man begins," says Kennier, "in a gelatinous condition; he ends in an osseous or bony one—soft in infancy, hard in old age. By the gradual change in the long space of years the ossification comes on; but after middle life is passed a more marked development of the ossific character takes place. Of course these earthy deposits, which affect all the physical organs, naturally interfere with their functions. Partial ossification of the heart produces the imperfect circulation of the blood which affects the aged. When the arteries are clogged with calcareous matter there is interference with circulation, upon which nutrition depends. Without nutrition there is no repair of the body. To repair the waste of the body so that the exquisite equipoise called perfect health may be maintained and the decay and blockage which advances with age may be kept at bay is to prolong our years."

It has been said, and most truthfully so, that a man's life expectancy can be estimated not so much by the length of years already to his credit, but by the condition of his circulation—by the amount of health and elasticity in the walls of his blood vessels. The sad mortality occurring in the latter half of life from apoplexy (the rupture of a cerebral blood vessel) would appear to corroborate the truthfulness of this observation.

The important question confronting us then is, how shall we meet these progressive degenerative changes and diminish their necessary interference with the powers of life? If lime and these earthy salts found stored up in the senile tissues be the insidious and dreaded powers of old age (and we must all admit they are an important factor), then to diminish their entrance into the system must tend to the prolongation of our existence. Almost everything we eat contains these calcareous salts, more especially meat and bread, which are very prolific sources of these mischievous accumulations. As Kennier observes, a diet consisting principally of fruit is best and most desirable for people advancing in years, for the reason that, being deficient in nitrogen, the ossific deposits so much to be dreaded are more likely to be suspended. Fruits, fish, poultry and the flesh of young animals contain less of these objectionable elements, and are consequently preferable. The free use of distilled water, with dilute phosphoric acid, is strongly advocated as means to retard old age. Now, as carbonate of lime exists in nearly all drinking water, its distillation would entirely eliminate this noxious element and besides cause the water to become a decided solvent of the various earthy salts already in the system; therefore its daily use would seem to be a most important means in preventing the calcareous degeneration of the arteries and tissues. Valuable, however, as may seem the use of distilled water in latter life, its use may be abused, for recent investigation has shown that by long and continuous use it may become injurious, from the fact that this very property of extracting salts from animal tissues will cause them to swell by inhibition.

In this age of serious and mature thought and scientific investigation *diet* is awarded a place of no small magnitude, not only in the treatment of disease and its prevention, but in the extension of life as well. When it is fully realized that the majority of chronic diseases are due in great part to excesses in eating and drinking, great and lasting benefits will accrue to our people. Alexander Haig, in his remarkable book on "Uric Acid as a Factor in the Causation of Disease," proves conclusively the close relationship existing between the use of foods containing uric acid in an appreciable amount or capable of producing it within the body to an excess, and the production of headache, mental depression, melancholia, epilepsy, asthma, gout, rheumatism and other various affections which decrease life as well as cause great misery. The class of food containing this poison in greatest quantity is tea, coffee and cocoa, and the class containing elements which may produce it to a damaging excess within the economy are the animal meats, their soups and extracts. By sharply decreasing, if not entirely avoiding, their use we may escape many derangements of health, not the least of which is the deleterious power exerted by this poison over the circulation, for it intensifies that damaging characteristic of old age, obstruction to the capillary circulation. To avoid these dangers, Haig and his followers condemn the use of all stimulants and all animal food, except milk and its products, cheese and butter, also as well entering a plea for vegetarianism, claiming that the vegetarian has superior powers of endurance and better health than those devoted to the use of meats. Both, then, by the theory of calcareous accumulations and by that of uric acid poisoning, animal meats work serious consequences to those addicted to their excessive use. There is no room to doubt that our people are bringing untold trouble upon themselves from a want of care along this line.

It is now claimed by many observers that we have in "nature's vegetable meat," the nut, a perfect and far more healthy substitute for the proteid nutriment afforded by flesh meats. Even the common peanut, according to Dr. Kellogg, contains nearly fifty per cent. more of this important element of food than the same weight of the best beef. Now, the proteid or albuminoid element of food so richly stored in the nut contains nitrogen and supplies the means for the foundation and repair of the tissues, brain, muscles, nerves, glands, blood corpuscles and the resisting force against disease. Protoplasm, the center of cell life, is formed of and sustained by proteids. They are therefore the most important elements in our diet, and are the only ones, when used alone, that are capable of sustaining life. In France nuts are largely used as an article of diet, especially by the indigent classes.

In the whole catalogue of food substances, there are none more wholesome than fruit, and with proper precaution it may be used in almost any condition of disease as well as health. Remote Scandinavian traditions represent the apple as the food of the gods, who when feeling the approach of old age and its attending infirmities sought the apple as being a medicine leading to renewed activity of body and mind.

I would not attempt to formulate a code of inflexible hygienic rules for the preservation of mental and physical health, but a few more suggestions fall within the scope of this paper. Along with imprudent eating inactivity of both body and mind tends towards physical degeneracy. Proper rest strengthens and invigorates, inactivity weakens and destroys. Proper attention to deep breathing and systematic exercise are important factors tending to retard premature old age, as by increasing the circulation of the blood, and therefore the nutrition of the body, we establish a firmer prestige. Further, the abandonment of our regular and accustomed vocations, retiring entirely from business life, especially as we enter old life, is a dangerous experiment, frequently entailing disaster of no slight importance.

The suggestion of Dr. Hermann Heber, that for most people beyond the age of fifty more than six or seven hours of sleep in twenty-four is calculated to injure, would seem to be true, as well as feasible, for in sleep the circulation becomes sluggish, torpid and diminished, so from this fact prolonged sleep tends to intensify that most serious defect incident to old age, namely, insufficent nutrition arising from the incapacity of the heart to carry on the normal circulation through the narrowed and inelastic blood vessels. Wakefulness hitherto has been regarded as indicative of senility, but according to this theory it is a conservative symptom, and is but nature's effort to shield the aged from physical and intellectual decay.

Without attempting to be exhaustive, I have endeavored within the space allotted me to set forth such truth and facts and offer such suggestions as may be of service in guiding you through life, so that when its inevitable downward stage is upon you many of its necessary disadvantages may be mitigated and others altogether avoided.

DRINKING WATER.

READ BY DR. W. T. PATE, OF GIBSON, N. C., AT THE WILSON HEALTH CONFERENCE.

It has been my observation that there is no surer way to displease a friend, or block the avenue to friendly relations with a stranger, than to condemn his drinking water. Associations have invested our water supplies with a sentiment next to home itself. It seems hard to realize that the spigots that have administered to our wants and necessities in days of health and pleasure could in an evil hour dispense sickness and bereavement; or that the well that had furnished water to raise a family could also exterminate it. It is not my purpose to rob this necessary element to our existence of any of its sentiment, but to try to make it more deserving by calling attention to the fact that the good and bad are so thoroughly mixed in all things that it even applies to water supplies.

All drinking water, unless it be that from deep artesian wells, contains bacteria, or unicellular vegetable organisms, which are like vegetables of a higher type, in that some kinds are harmless—even wholesome—while other kinds are poisonous. We speak of water as being contaminated when it contains some of these poisonous organisms. The chief source of the bacteria found in drinking water is from the soil. For our purpose we will speak of the modes of contamination as direct and indirect. Direct when the dangerous bacteria are introduced into the water from first hands. Indirect when the bacteria are deposited upon the earth and then carried into the drinking water by the rain that falls upon the surface or the water that percolates through the soil.

About seven per cent. of the population of North Carolina obtain their drinking water from public supplies, the source of nearly all of which is surface-water exposed to both direct and indirect contamination. But this will hardly be accomplished before an educated public sentiment demands it. When the consumers of public water fully realize that pure water and a good health record go hand in hand to attract desirable home-seekers and capital; when they thoroughly appreciate the fact that their own prosperity, happiness, health and lives depend upon the purity of their drinking water; when they feel that the suffering and death from typhoid fever in the community are due to some one's carelessness and might be prevented—then they may be depended upon to see that every precaution known to sanitary science is thrown about the public water supply.

The men occupying the best position to teach these truths of sanitation and create this public sentiment are the physicians of the town. Any town having a public water supply that is causing an unusual number of cases of typhoid fever and other water-borne diseases is a reproach to the physicians of the community. Every man of means and influence has a family physician, and if that guardian of the health of the home will take the pains to impress upon his patron the importance of pure drinking water, he will not only demand it, but will support any reasonable measure to improve and protect the public supply. I say this with all due respect to our efficient State Board of Health. Its work is gaining in appreciation among the people, and is attracting attention beyond our own borders. I have heard its work commended from the State of Maine. But the Board can at best only direct, map out the work and suggest plans. If the highest practical good is to be accomplished for the community and the State, the Board must have the hearty, active co-operation of her intelligent citizens, and especially that of the medical profession.

The remaining ninety-three per cent. of our population represent the inhabitants of the smaller towns and the country, who are less fortunate than their city cousins, in that each home has its own supply, and must bear the expense and exercise the necessary care to keep their drinking water in a safe condition or suffer the consequences. The chief burden of these supplies is sustained in complying with the last named condition. These supplies consist principally of dug or open wells and driven wells. The latter are safer, since they are exposed only to indirect contamination. Open wells from which the water is brought to the surface in buckets are filthy and dangerous. Any one who has seen one of these wells cleaned out knows what a quantity of filth finds its way into the water from the open top. Every one that draws a bucket of water handles the wet bucket and chain and sends it down to be washed off by the water in the well, which amounts to about the same thing as washing the hands in the drinking water, not to speak of contamination by mosquitoes and other insects. Such wells undoubtedly cause many cases of gastro-intestinal troubles, not usually fatal, except among small children. And if typhoid fever is carried to a home using an open well it takes intelligent management to prevent the drinking water from becoming contaminated, and servants do not always possess the necessary intelligence, as was shown in a case that came under my observation at a farmhouse two miles east of Gibson.

This well had been in use more than five years. It was the boast of the owner that he had the best water in his section, and that there had never been a case of typhoid fever on his plantation. During the winter of 1895 a son was carried to this home with a well developed case of typhoid fever. A nurse was employed at once, the patient isolated, and the physicians in attendance thought every precaution had been taken to protect the other members of the household; but in about three weeks two other members of the family were sick with the fever. The physicians were puzzled until it was learned that the launderer had remarked that the doctors might know something about medicine, but that they didn't know anything about washing; and instead of carrying the linen, bundled by the nurse, from the sick-room to the kettle and boiling for a half hour before washing, as directed by the physicians, he had first washed the clothing in warm suds, drawing his own rinsing water at the open well. This act of carelessness and ignorance cost the life of one member of the family.

Another case showing the extreme liability of open wells to typhoid contamination occurred just across the line from Gibson in South Carolina. Another plantation home—an open well with sweep, hand-pole and bucket, a bench adorned by a row of tubs, a wash-pot, and a mudhole with a few brickbats in it—all within a radius of fifteen feet—the counterpart of many domestic water supplies in North Carolina to-day.

There had been no case of typhoid fever here. During the winter of 1884 a married daughter died of typhoid fever in another county. Her sick child was carried by its grandmother to this home, some fifteen miles away. The child died; members of the household and neighbors and friends who visited them in due time began to have fever; an epidemic broke out in the community; and if it were possible for any one to state the number of cases that were carried directly and indirectly from that well, the cost of life and property to the community, it would seem incredible. I know that some families were so reduced by sickness, death and debt that their homes went into other hands.

Where it is practicable only driven wells should be used to obtain water for domestic purposes. Where it is necessary to dig wells, after an unfailing flow of water is secured, terra-cotta well-pipe should be placed in the well and the well filled in, the top closed and the water raised by suction. Where the terra-cotta pipe is too costly a two-inch iron pipe can be carried to the bottom of the well, this filled around with stones above the level of the water, three feet of chalk and clay packed in above the stones and the well filled with clean earth. This will prevent direct contamination and lessen the attraction for surface-water. Indirect contamination can be prevented by a clean soil. A circle with a radius of one hundred feet should be drawn around the well and the perimeter designated the danger line, and nothing that would pollute the soil should be allowed within this circle—not even an open well. I have seen driven wells placed within a few feet of an open well to improve the water supply. It is needless to say that there was no improvement. All waste-water from the well, wash-basins, etc., should be conveyed beyond the danger line in water-tight pipes. Another important matter is surface drainage. The stables, pig-styes, etc., should be so placed on the premises that the surface drainage will be away from the well. One hundred feet, or any other reasonable distance, will not protect a well on a slope below polluted soil. I have seen a driven well twenty-eight feet deep on a slope three hundred feet away from a basin polluted for a generation contain intestinal bacilli from the first. Another instance is that of a factory village built on an eastern slope. Near the brow of the hill is a row of out houses. One hundred feet or more down the grade is a broad street, a row of houses on either side of the street, and driven wells along its centre, more than one hundred feet from the out-houses, along the brow of the hill. For the first few years the village was not infected with typhoid fever. In December, 1895, I was asked by the president of the company to see a boy in the village that was thought to be crazy. I found him sitting up, temperature 104, delirious, with other symptoms of typhoid fever. The attention of the president of the company was called to the bad arrangement of the village, and warned of the danger. A meeting of the directors was called, but nothing was done. The number of cases have increased year by year until now. In September I was informed by one of the three physicians who practice among the operatives that he then had thirty cases of typhoid fever under treatment in the village, and that the death rate was high. This is due to the surface-water from the row of out-houses along the brow of the hill running down the slope and infecting the wells.

In conclusion, I would say: Use only underground wells; raise the water by suction; see that the soil is free from pollution within one hundred feet radius of the well, and drain all polluted soil on the premises away from the well. By a strict observance of these simple precautions it is possible, in a primitive soil, to obtain water with less than 100 harmless bacteria per cubic centimeter.

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